SONY

DIGITAL COLOR PRINTER

UP-D2500

SERVICE MANUAL

Vol. 1 (1st Edition)

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SONY

3-860-609-11 (1)

Digital Color Printer

SECTION 1
OPERATING INSTRUCTIONS

This section is extracted from operation manual.

Operating Instructions Page 2

Before operating this unit, please read this manual thoroughly and retain it for future reference.

UP-D2500

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English

Owner's Record

The model and serial numbers are located at the rear. Record these number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. _____
Serial No. _____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

For the customers in the U.S.A.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection agaist harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.
This device requires shielded interface cables to comply with FCC emission limits.

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About This Manual

This manual is divided into four chapters. This section explains the organization of this manual.

Introduction
Describes the features and system configuration of the digital color printer. Notes the precautions to be observed when using the printer. Also provided is information on the location and function of parts.

Preparation
Explains the steps involved in setting up the printer prior to getting started—checking the supplied accessories, assembly and connections.

Operation
Describes loading of the ink ribbon cassette and print paper and actual printing operation.

Others
Provides technical information on the printer, how to handle error occurrence, and how to deal with paper jams.

Conventions used

Cross reference
Throughout this manual you will find the references to other sections of the manual that contain related information.

Important note
Be sure to read the sections of the manual marked Note. They explain points that you should be aware of to operate the printer correctly and prevent malfunctions.

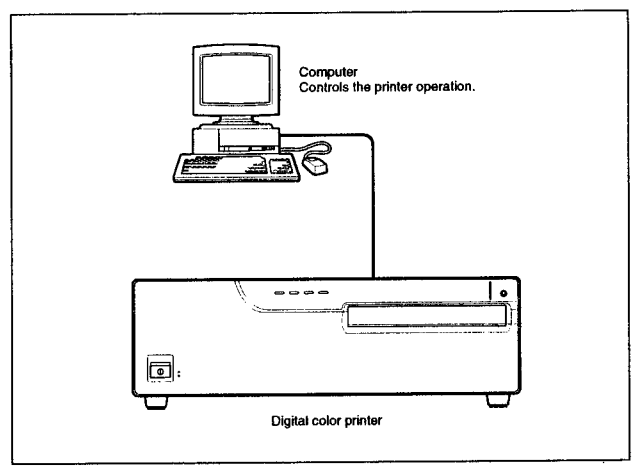
Trademarks
Windows is the trademark of Microsoft Corporation, USA.
Macintosh and APPLE DESKTOP BUS are the trademarks of Apple Computer, Inc., USA.
Macintosh Plus, Macintosh Classic, Macintosh LC and Duo are trademarks of Apple Computer, Inc.

System Overview

The Sony UP-D2500 digital color printer is designed to reproduce computer images on A6-size paper.
You can print out image data of Windows or Macintosh graphics application software in high resolution (310dpi) and 256 shades of gray or in full color (16,700,000 colors).
By connecting the computer which supports ECP mode that is high transmission mode, data can be transmitted to and from a computer at high speed.
For details, refer to the computer's manual.

System Configuration

The following shows an example printer system configuration.



About the instruction manual of the printer driver
The instruction manual for the printer driver is supported by storing in the DOC file of the supplied 2HD floppy disk for the printer driver application program.

Precautions

Safety

- Operate the printer using the power source specified in "Specifications" (page 23)
- Be careful not to damage the power cable by placing or dropping heavy objects on it; it is dangerous to use the unit with a damaged power cable.
- If you do not intend to use the unit for a long time, disconnect the power cable.
- Unplug the power cable by grasping the plug, not the cable itself.
- Do not disassemble the unit.
- Do not remove the cover. There is a danger of electric shock from the internal parts.
- Be careful not to spill water or other liquids on the unit, or to allow combustible or metallic material to enter the cabinet. If used with foreign matter in the cabinet, the unit is liable to fail, or present a risk of fire or electric shock.
- Ventilation holes are provided to prevent the unit from overheating. Be careful not to obstruct them with other units or by covering the unit with a cloth etc.
- If the unit malfunctions or if a foreign body falls into the cabinet, disconnect the power immediately and consult your Sony service facility or your Sony dealer.

Installation

- Avoid placing the unit in a location subject to:
  — mechanical vibration
  — high humidity
  — excessive dust
  — direct or excessive sunlight
  — extremely high or low temperatures
- Do not use other electronic equipment near the unit. The unit will not work properly in strong electromagnetic fields.
- Do not place a heavy object such as a monitor on the printer.

Condensation

- If the printer is subject to wide and sudden changes in temperature, such as when it is moved from a cold room to a warm room or when it is left in a room with a heater that tends to produce large amounts of moisture, condensation may form inside the printer. In such cases the printer will probably not work properly, and may even develop a fault if you persist in using it. If condensation forms, turn off the power and leave the printer to stand for at least one hour.
- If the printing pack is subjected to wide and sudden changes in temperature, condensation may form on the ink ribbon or paper. This will cause the printer to malfunction. Also, if the printing pack is used in this state, spots are likely to appear on the printout. Therefore, avoid storing the printing pack in locations subject to wide and sudden changes of temperature.
- To store a half-used printing pack, replace it in its original packing and reseal the package. If possible, keep the sealed printing pack in a cool, dark location. To subsequently use the printing pack, place it, in its sealed package, in a warm room for several hours. Doing so prevents condensation from forming when the printing pack is removed from its package.

Location

To prevent internal heat built-up, leave enough room around the printer for air to circulate through the vents on the left hand side of the cabinet.

On transportation

Do not transport the printer with the supplied accessories. Doing so may cause malfunction.

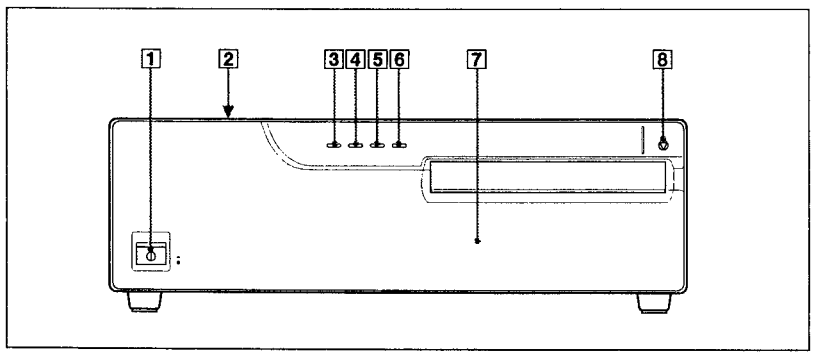
Cleaning

Clean the cabinet, panel and controls with a soft dry cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine, which may damage the finish.

Location and Function of Parts and Controls

For details, refer to the pages given in parentheses.

Front



1 POWER switch
Press to switch the unit on or off. The POWER lamp lights green when the power is on.

2 Top cover
Do not open this top cover. Only for service personnel.

3 PRINT indicator
Lights while printing.
Blinks while the printer is receiving data.

4 ALARM indicator
Lights in case of paper jamming or occurrence of any other problem.

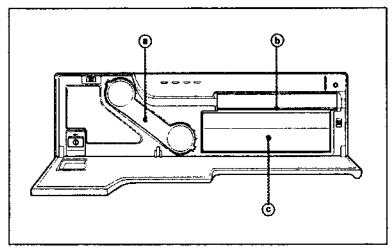
5 RIBBON indicator
Lights when a problem for ink ribbon cartridge occurs.

6 PAPER indicator
Lights when a problem for paper occurs.

The printer allows you to check the printer operating condition according to the lighting conditions of the PRINT indicator, ALARM indicator, PAPER indicator and RIBBON indicator.
For details, see "Indicators on the Front Panel" on page 25.

7 Front panel
Pull the top on the front door toward you to open it.
Opening the front panel reveals the ink ribbon cartridge, paper tray and paper cover

When the front panel is open



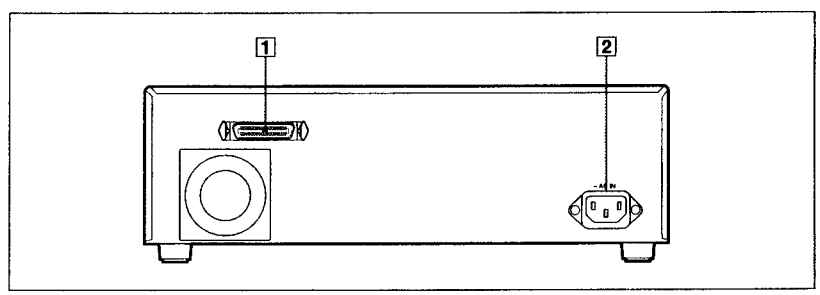
ⓐ Ink ribbon cartridge (11, 15)
Insert the ink ribbon cartridge.

ⓑ Paper cover (11)
Paper is ejected onto this cover.

ⓒ Paper tray (11, 18)
Load paper into this tray.

8 STOP button
Press to stop printing midway.

Rear

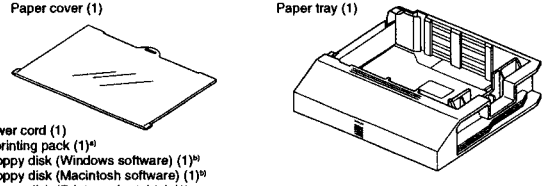


1 Parallel interface connector (Amphenol 36-pin) (12, 13)
Used to connect a Windows or Macintosh computer via the parallel centronics interface (IEEE-1284), using the parallel data cable (not supplied).

2 ~AC IN connector
Used to connect the printer to a wall outlet with the supplied power cord.

Supplied Accessories

The printer is packed together with the following accessories. Check that nothing is missing from your package.



AC power cord (1)
Color printing pack (1)[a]
2HD floppy disk (Windows software) (1)[b]
2HD floppy disk (Macintosh software) (1)[b]
2HD floppy disk (Printer color table) (1)
Software licence agreement (1)
Operating Instructions (1)
Warranty card (1)
User Registration card (1)

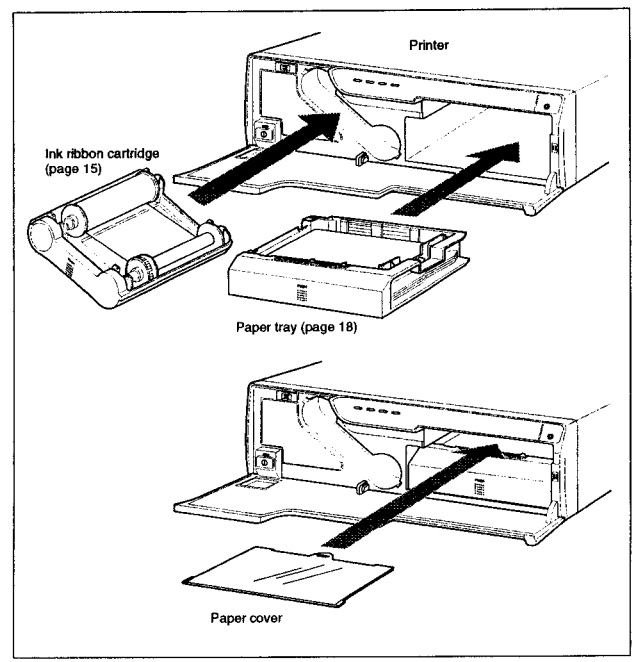
a) Use the ink ribbon cartridge and paper for operation check.
b) The instruction manual of the printer driver is stored in the DOC folder of the floppy disk. For detailed information, see page 14.

Notes

- Retain the original carton and packing materials in case you have to transport the unit in the future.
- Remove the ink ribbon cartridge and paper tray when transporting the printer.

Assembly

Attach the supplied paper cover, paper tray and ink ribbon cartridge to the printer. For details of how to assemble them, see the pages given in parentheses.



Connecting the Computer

The UP-D2500 connects to either of the computer Windows or Macintosh via the parallel interface.

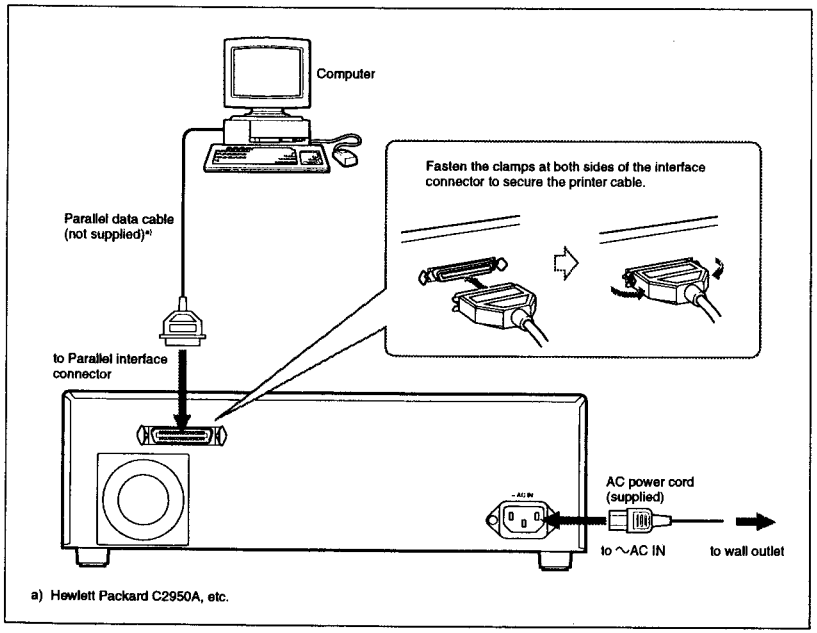
Notes

- Turn off the power of each device before attempting to make any connections.
- Grab the connector at the end of the connecting cable, and firmly insert it into the socket.

Connecting the Windows Computor

Notes

- Use the shielded cable that should be less than 3 meters and conforms to the parallel specification, as the printer cable.
- To use the printer in ECP mode, use an interface cable in conformity to IEEE STD 1284 such as Hewlett Packard C2950A.


Computer
Fasten the clamps at both sides of the interface connector to secure the printer cable.
Parallel data cable (not supplied)a)
to Parallel interface connector
AC power cord (supplied)
to ~AC IN
to wall outlet

a) Hewlett Packard C2950A, etc.

Note

The parallel cable connection requirement can vary between different computers and peripherals. For the details of your installation, refer to the manual of your computer and peripherals.

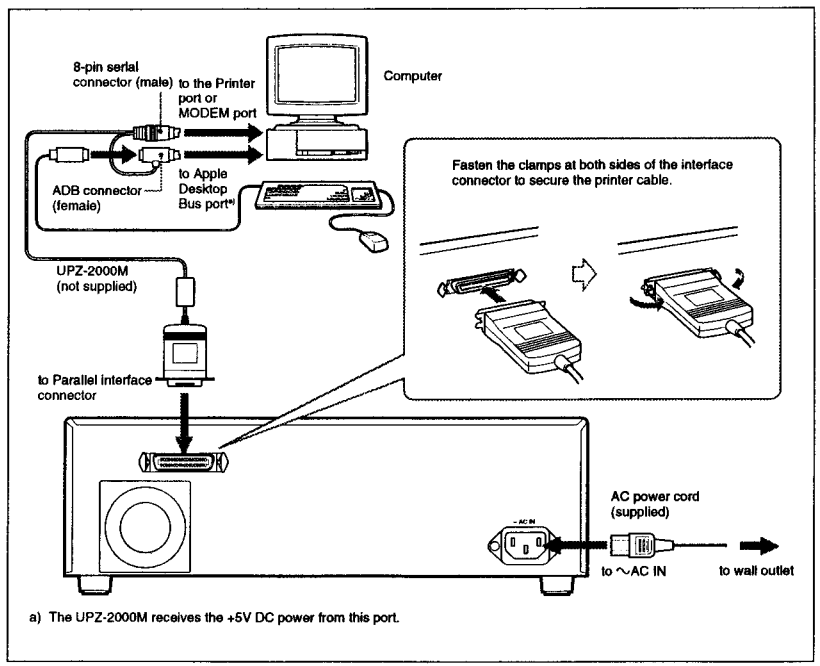
Connecting the Macintosh Computor

Note

To connect the printer to the Macintosh computer, the UPZ-2000M interface cable (not supplied) is required.

Connectable Macintosh computer

- Desk-top type Macintosh computer (excluding Macintosh Plus or former models, Macintosh Classic series, Macintosh LC series)
- Note-book Macintosh computer (exluding the Duo series)


8-pin serial connector (male)
to the Printer port or MODEM port
Computer
ADB connector (female)
to Apple Desktop Bus porta)
Fasten the clamps at both sides of the interface connector to secure the printer cable.
UPZ-2000M (not supplied)
to Parallel interface connector
AC power cord (supplied)
to ~AC IN
to wall outlet

a) The UPZ-2000M receives the +5V DC power from this port.

Note

The communication mode is Compatible, Reverse Nibble mode (IEEE STD 1284-1994) when connecting to the Macintosh computer.

Installing the Printer Driver Program

The printer driver program should be installed before starting operation and required setup should be performed according to the instruction manual of the printer driver.
The instruction manual for the printer driver is supplied by storing in the DOC file of the 2HD floppy disk for the printer driver application program.

To open the file of the instruction manual of the printer driver
For detailed information on how to open the file of the instruction manual of the printer driver, open the readme file first. The readme file instructs you how to open the file of the instruction manual of the printer driver.

Before Printing

This section describes the following operations that must be made prior to starting printing after mounting the paper tray and paper cover on the printer and making the necessary connections.
- Loading an ink ribbon cartridge (see the below)
- Loading paper (see page 18)

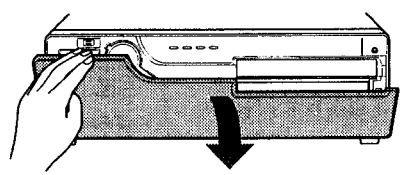
Once the above operations have been completed, there should be no need to repeat them during routine printing. Perform them only when absolutely necessary.

Loading an Ink Ribbon Cartridge

To make printouts, an ink ribbon cartridge and paper (which are compaticble) must be loaded. (see "Ink Ribbon Cartridge and Paper" page 22)
Use the ink ribbon cartridge and print paper (supplied) to check if the printer functions properly.

Note
Use only ink ribbon cartridge and paper that are designed for use with this printer. Failing to do so is likely to result in unsatisfactory printing or malfunctions.

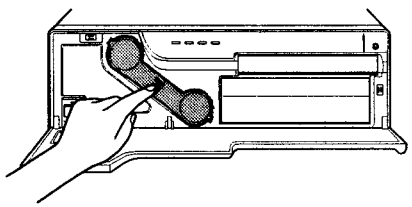
1 Open the front panel by pulling the front panel top toward you.

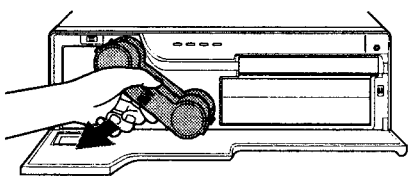


Continue to next page →

Before Printing (continued)

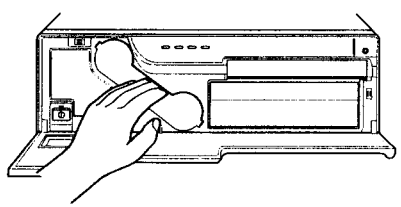
2 Remove the ink ribbon cartridge by pushing the ink ribbon cartridge itself.
The ink ribbon cartridge pops out.
When you use the printer first, this operation is not required.





Note

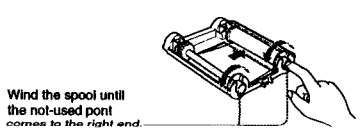
Never put your hand into the ink ribbon compartment. The thermal head becomes very hot. You may burn yourself if you touch it.



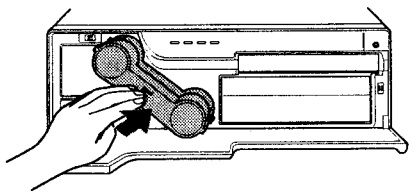
When the ink ribbon cartridge cannot be ejected

Turn the power off, then back on again. Then, after a while, press the ink ribbon cartridge.

3 Remove any slack from the ink ribbon.
If the ribbon is left slack, it may be damaged when inserted.



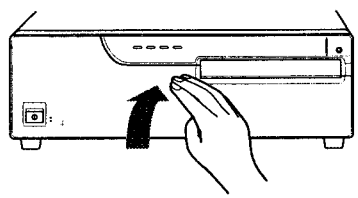
4 Insert the ink ribbon cartridge firmly until it stops.



When the ink ribbon cartridge cannot be inserted

Turn the power off, then back on gain. Then, insert the ink ribbon holder.

5 Close the front panel.



Notes

When using ink ribbon cartridge

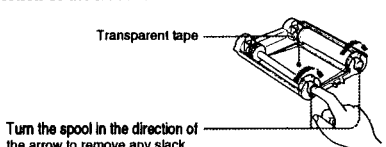
- Once an ink ribbon cartridge has been completely used, replace it. Ink ribbon cartridges are not reusable.
- Do not touch the ink ribbon cartridge or place it in a dusty location. Finger prints or dust on the ink ribbon will result in imperfect printing or malfunction of the head.

When storing ink ribbon cartridge

- Avoid placing the ink ribbon in a location subject to:
  - — high temperatures
  - — high humidity
  - — excessive dust
  - — direct sunlight
- Store a partially used ink ribbon cartridge in its original packaging.

If your ink ribbon should tear

Repair the tear with transparent tape. There should be no problem with using the remaining portion of the ribbon.


Transparent tape
Turn the spool in the direction of
the arrow to remove any slack
until the transparent tape cannot
be seen.

Loading the Paper

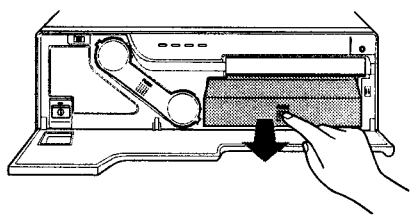
To load paper, follow the procedure below. Be careful not to touch the printing surface.

Note

Use only ink ribbon cartridge and paper that are designed for use with this printer. Failing to do so is likely to result in unsatisfactory printing or malfunctions.

1 Open the front panel by pulling the front panel top towards you.

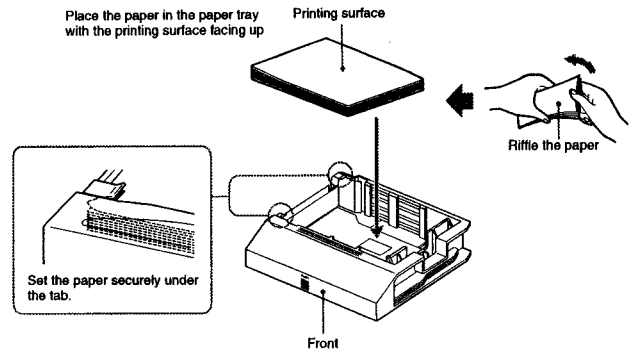
2 Push the part marked with PUSH on the paper tray.
The paper tray pops out.



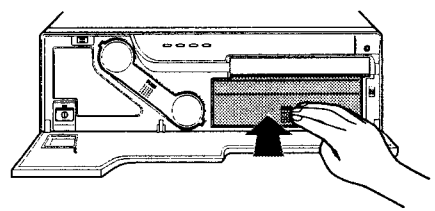
3 Place the paper in the paper tray.

Notes

- The amount of paper that the paper tray holds depends on the paper in use. When adding paper to a partly full tray, be careful that the total number of sheets does not exceed the limit. If you exceed this limit, paper jams may occur.
  The limit is the amaunt of paper coutained in one printing pack.
  For detailed information on the maximum amount of paper that the paper tray can hold, see "Ink Ribbon Cartridge and Paper" page 22.
- Do not place different types of paper in the tray. Doing so may cause paper jams to occur.
- Load the paper so that it lays flat in the paper tray. If the paper is curled, it will overflow from the paper tray and the printing position may shift. If this happens, load fewer sheets in the paper tray.


Place the paper in the paper tray with the printing surface facing up
Printing surface
Riffle the paper
Set the paper securely under the tab.
Front

4 Slide the paper tray back into the printer until it clicks into place.



5 Close the front panel.

Notes

When handling the paper

Do not touch the printing surface. Dust or finger prints are likely to cause unsatisfactory printing or malfunction of the head. Hold the paper by the printing surface protection sheet.

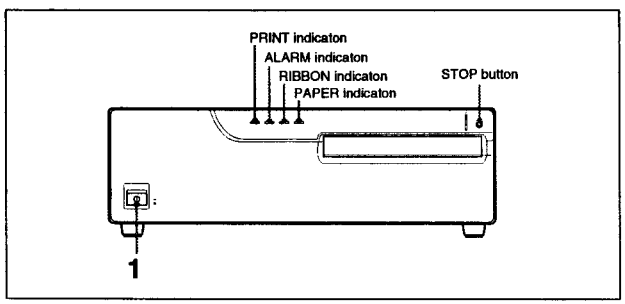
When storing print paper

- Avoid storing the print paper in a location subject to:
  — high temperatures
  — high humidity
  — excessive dust
  — direct sunlight
- Use the original package for storing unused paper.

Printing

Before printing

- Ensure that the printer is properly connected to the computer (page 12).
- Ensure that the printer driver application program is stored in the computer and the required setup on the computer has been completed.
- Ensure that the correct ink ribbon cartridge and paper are used (page 22).
- Ensure that the ink ribbon cartridge and print paper are properly loaded (pages 15 and 18).



1 Turn on the power of the printer, then computer.
All indicators, PRINT, ALARM, RIBBON and PAPER are lit, then all of them go out. Now the printer is in standby status.

Notes

- When the printer is connected to the computer through the parallel interface bus, turn on the power of the printer before turning on the computer.
- Never turn the printer on or off while the computer is accessing its hard disk, floppy disk.

2 Turn on the power of the computer.

3 Send the image data from the computer to the printer, then send the print command.

For detailed information, read the instruction manual of the printer driver.

While the printer is receiving the image data from the computer, the PRINT indicator blinks.
While the printer is printing, the PRINT indicator is lit.

Notes

- Do not turn off the power during printing. If you do so, paper may not be ejected and may jam in the printer.
- Do not pull the paper out till the printer finishes printing.

To stop transferring the data or printing midway

Send the command to stop transferring data from the computer or printing or press the STOP button.
The printer returns to standby status.

If the printer does not print

The printer will fail to print in the following cases when the ALARM, PAPER, and/or RIBBON indicator light.
For detiled, see "Indicators on the Front Panel" page 25.

Notes

When storing your printouts:

- Avoid storing the printout in a location subject to high temperatures, high humidity, excessive dust and direct sunlight.
- Do not stick tape on a printout. Also, avoid leaving a plastic eraser on a printout or placing a printout in contact with materials which contain plasticizer (under a desk mat, for example).
- Do not allow alcohol or other volatile organic solvents to come into contact with the printouts.

Ink Ribbon Cartridge and Paper

Both paper and an ink ribbon cartridge are necessary for printing. Use the ink ribbon with the paper contained in the same package.

Color Printing Pack UPC-2010
Contains color ink ribbon cartridge and paper.
Color ink ribbon cartridge 1 roll
A-6 (4 ¼ × 5 ¾ inches) size paper 200 sheets

Self-laminating Color Printing Pack UPC-2040A
Contains an ink ribbon cartridge and paper for automatic laminate coating.
Color ink ribbon cartridge 1 roll
A-6 size paper 120 sheets (The size is a little larger than paper of another printing pack).

16-split Self-adhesive Pre-cut Color printing pack UPC-20S16E
Contains an ink ribbon cartridge and paper for sticker of 16 reduced images.
Color ink ribbon cartridge 1 roll
A-6 (4 ¼ × 5 ¾ inches) size paper 200 sheets

4-split Self-adhesive Pre-cut Color printing pack UPC-20S04E
Contains an ink ribbon cartridge and paper for sticker of 4 reduced images.
Color ink ribbon cartridge 1 roll
A-6 (4 ¼ × 5 ¾ inches) size paper 200 sheets

Color Postcard Printing Pack UPC-2070E
Contains an ink ribbon cartridge and paper for post cards
Color ink ribbon cartridge 1 roll
A-6 size paper 150 sheets (The size is a little larger than paper of another printing pack).

B/W Printing Pack UPC-2020
Contains an ink ribbon cartridge and paper.
B & W ink ribbon cartridge 1 roll
A-6 (4 ¼ × 5 ¾ inches) size paper 200 sheets

Notes

- Use only the ink ribbon cartridge and paper designed for use with this printer. If you use a different type, the printer may not print properly or malfunction.
- Use the ink ribbon with the paper contained in the same package. If the printer detects an incompatible combination, ALARM and RIBBON indicators are lit. Doing so may result in degradation of the print picture quality and occurrence of any trouble.
- Ink ribbon and paper are not reusable. Once exhausted, replace them with new ones.

About UPA-2002 paper tray (not supplied)
The paper size of the UPC-2040A self-laminating color printing pack and the UPC-2070E postcard color printing pack is a little larger than paper of other printing packs. The paper tray supplied with the printer is too small to load UPC-2040A and UPC-2070E paper.
To use these types of paper, the UPA-2002 paper tray (not supplied) is required.

Specifications

Printer

Power requirements
120 V AC, 50/60 Hz
Power consumption
About 1.8 A max. at 25°C, 120 V AC
Operating temperature
5°C to 35°C (41°F to 95°F)
Operating humidity
20 % to 80 % (no condensation allowed)
Storage and transport temperature
–20°C to 60°C (–4°F to 140°F)
Storage and transport humidity
20 % to 90 % (no condensation allowed)
Dimensions
About 370 × 125 × 417 mm (w/h/d)
(14⅝ × 5 × 16¾inches)
Mass About 9.5 kg (20 lb 15. oz)
Printing system
Sublimation heat transfer printing
Picture Memory
2 Mbytes
Picture element
Maximum 1365 × 1024 duts (310 dpi)
Thermal head
12.2 dot/mm (1024 dots)
Total gradation
256 levels each for yellow, magenta, and cyan
Digital interface
Parallel data interface - 1 channel
Amphenole 36-pin connector × 1
Printing time
Approximately 45 seconds
(for color printing, excluding the data transmission time)
Supplied accessories
Paper tray (1)
AC power cord (1)
Paper cover (1)
Color printing pack (1)
2HD floppy disk[a)]
(Windows software) (1)
2HD floppy disk[a)]
(Macintosh software) (1)
2HD folppy disk (Printer color table) (1)
Software license agreement (1)
User Registration card (1)
Warranty card (1)
Operating Instructions (1)
a) Contains data for the instruction manual for the printer driver
Optional accessories
Color printing pack UPC-2010
Self-laminating color printing pack UPC-2040A
16-split Self-adhesive Pre-cut color printing pack UPC-20S16E
4-split Self-adhesive Pre-cut color printing pack UPC-20S04E
Color Postcard printing pack UPC-2070E
B/W printing pack UPC-2020
UPA-2001 paper ejector
UPA-2002 paper tray
Interface cable UPZ-2000M

Interface

Control connector
IEEE 1284-B connector (amphenol 36-pin)
Input: Max. 5 V (TTL)
Output: Max. 5 V (TTL)
Data transmission system
8 bit, parallel,
IEEE STD 1284-1994 (Compatible, Reverse Nibble and ECP modes)
Logic level TTL

Parallel Interface connector pin assignment

Pin No.	I/O	Signal		
		Interface mode		
		Compatible	Nibble	ECP
1	I	nStrobe	HostClk	HostClk
2	I/O	Data1 (LSB)		
3	I/O	Data2		
4	I/O	Data3		
5	I/O	Data4		
6	I/O	Data5		
7	I/O	Data6		
8	I/O	Data7		
9	I/O	Data8 (MSB)		
10	O	nACK	PtrClk	PeriphClk
11	O	Busy	PtrBusy	PeriphAck
12	O	PError	AckDataReq	nAckReverse
13	O	Select	Xflag	Xflag
14	I	nAutoFd	HostBusy	HostAck
15		Not defined		
16–17		GND		
18	O	Peripheral Logic High (pull up to +5 V at 1 kilohm)		
19–30		GND		
31	I	nInit	nInit	nReverseRequest
32	O	nFault	nDataAvail	nPeriphRequest
33		Not defined		
34		Not defined		
35		Not defined		
36	I	nSelectIn	IEEE 1284 Active	IEEE 1284 Active

UP-D2500 supports Compatible, Reverse Nibble, and ECP modes of the two-way parallel interface standard (IEEE STD 1284-1994).

Design and specifications are subject to change without notice.

Troubleshooting

The following troubleshooting check will help you correct the most common problems you may encounter with your unit. Before proceeding with these trouble checks, first check that the power cord is firmly connected. Should the problem persist, unplug the unit and contact your sony service facility or your Sony dealer.

Symptom	Possible causes and remedies
Any indicators do not change even if the command is sent from the computer.	• The POWER switch of the printer is not set to ON. → Set the POWER switch of the printer to ON. • Connection may not be correct. → Check connections and rectify, if necessary. • Either paper or ink ribbon cartridge is not loaded. → Load the paper or ink ribbon.
The printer does not print.	The paper and ink ribbon cartridge are not loaded. → Load both the paper and ink ribbon.

Indicators on the Front Panel

If a problem occurs, the indicators on the front panel such as PRINT, ALARM, RIBBON and/or PAPER light or blink to indicate the problem condition.
The following table show the relation between lighting or blinking condition of each indicator and possible cause and remedies.

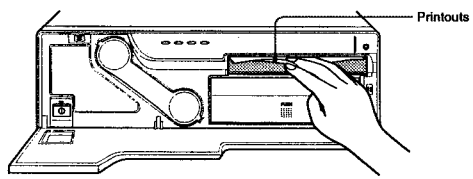
Indicators		Possible cause and remedies
Lighting	Blinking	
PRINT		Printing
	PRINT	Data receiving
PRINT	ALARM	• Printing stops midway. → The indicators stop lighting and blinking after the paper is ejected. • The paper which cannot be used, with this printer has been loaded. → Wait until the paper is ejected. Then, load the appropriate paper.
RIBBON		• The ribbon has been exhausted. → Replace the old ink ribbon cartridge with the new one. The ink ribbon cannot be reused. • The ink ribbon cartridge is not loaded. → Load the ink ribbon cartridge.
PAPER		• The paper has been exhausted. → Load the paper in the paper tray. • The paper tray is not installed. → Install the paper tray.
ALARM and PAPER		The ink ribbon cartridge and paper are not compatible. → Use a valid combination of paper and ink ribbon cartridge.
ALARM and RIBBON		• The ink ribbon cartridge is defective. → Replace the defective ink ribbon cartridge with the new one. • The ink ribbon has torn. → Repair the tear. • The ink ribbon cartridge that cannot be used with the printer. → Load the appropriate ink ribbon cartridge.
ALARM		The paper has jammed inside the printer. → Remove the jammed paper.
PRINT, ALARM, PAPER and RIBBON		• Serviceman-call trouble occurs. → Turn off the power immediately and contact your Sony service facility or your Sony dealer.

If the Paper Jams

If the paper jams after starting printing, the ALARM indicton jammed lights
Follow the steps below to remove the jammed paper.
When the jammed paper is removed, you do not need to continue operation explained below. Stop operation and reset removed paper cover, paper tray or ink ribbon holder if any.

1 Open the front panel.

2 If any printouts have been ejected to the paper cover and have accumulated on the paper cover, remove them. If not go to the next step.



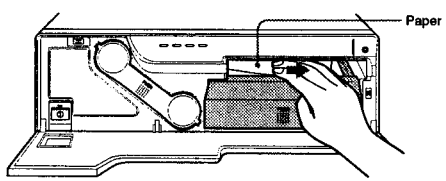
3 Turn off the power of the printer.

4 Remove the paper tray.
When you can see paper inside the printer, go to step 5.
When you cannot see paper, go to step 8.

5 Slowly pull the paper into the paper tray.

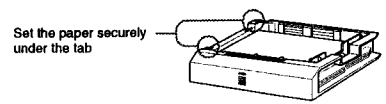
Note

Never attempt to pull a jammed paper down, up, backwards, or forwards, the paper may tangle or tear.
If you cannot pull the paper, go to the next step.



6 Remove the paper tray.
If the paper has jammed around the slot where the paper is fed, remove it.

7 Load the paper into the paper tray correctly.
Do not reuse the paper put back in step 5. Discard that paper.



8 Remove the ink ribbon cartridge.
If there is a jammed paper, slowly pull out the paper.
If the ink ribbon cartridge cannot be removed, the printer must not be operated. Contact your Sony service facility.

9 Re-insert the removed paper tray, paper cover or ink ribbon cartridge if you removed, then close the front panel.

10 Turn on the power of the printer.
When the ALARM indicaton does not light, you can use the printer as normal.
If the ALARM indicaton lights again, the printer must not be operated. Turn off the power immediately and contact your Sony service facility.

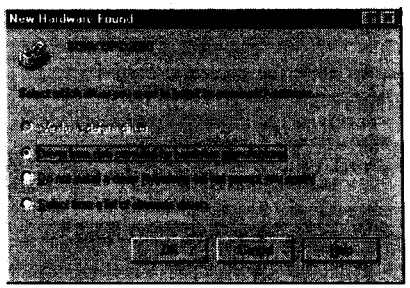
UP-D2500 Series Printer Driver for Windows95

Before You Begin

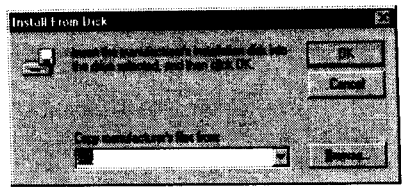
1. If you plan to operate the printer in the ECP mode, you need to set your PC's BIOS to ECP. For more details, refer to your PC's documentation. Note that some PCs may not support the ECP mode.
2. Be sure to use an IEEE1284-compliant cable. Using printer cables not compliant with IEEE-1284 may result in incorrect printing.

Installation

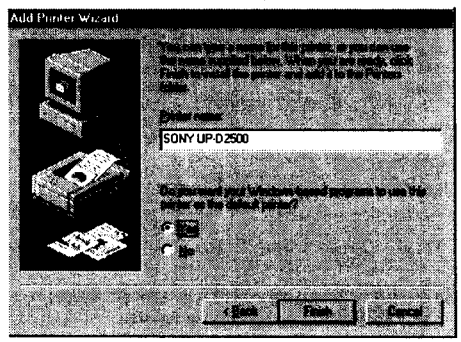
1. Connect the UP-D2500 series printer to your PC.
2. Turn on the UP-D2500 series printer.
3. Turn on your PC.
4. When Windows95 starts up, the following dialog will appear. Select "Driver from disk provided by hardware manufacturer."



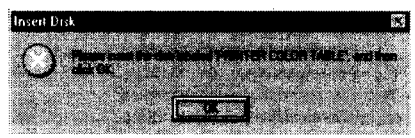
5. Insert the disk labeled "PRINTER CHOOSER LEVEL DRIVER" into the floppy drive.
6. From the "Install From Disk" dialog, select the floppy drive (A: in this example) and click on "OK".



7. From the "Add Printer Wizard" dialog, click on "Finish".



8. When the "Insert Disk" message appears, insert the disk labeled "PRINTER COLOR TABLE" and click on "OK".



This completes the installation.

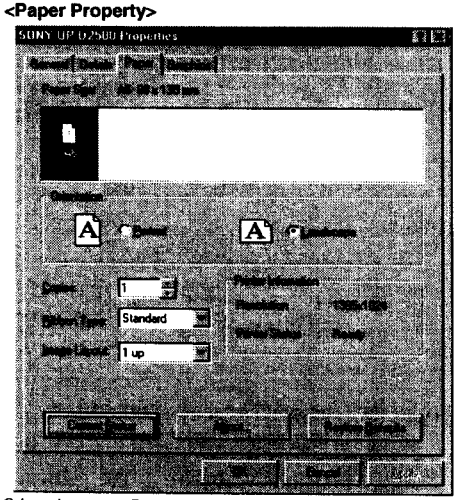
Note **If your PC is already running, you can go to Control Panel - System - Device Manager and click on Update to install the driver in the same way.**

Configuring the Printer

After installation, you need to configure, from printer properties in Printers folder of Windows95 (Right click the "SONY UP-D2500 Series" icon). Or, you can also choose Printer Setup" from the File menu of the application software in use.

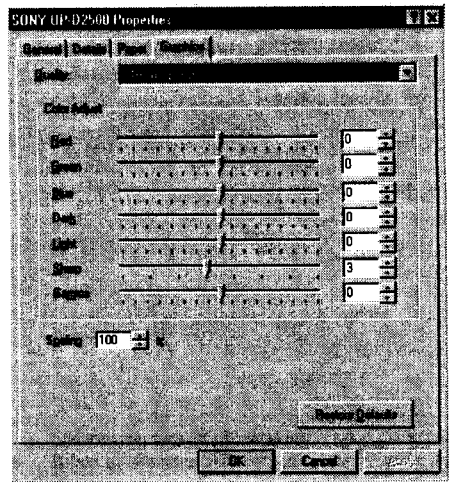
Note that in the "SONY UP-D2500 Properties" dialog, the "General" and "Details" and "Sharing" property sheets are Windows95 original. On the other hand, the "Paper" and "Graphics" property sheets are UP-D2500 Series specific.

<Paper Property>



Orientation : Set paper orientation to Portrait or Landscape.
Copies : You can specify up to 200 copies.
Ribbon Type : "Standard", "Lamination", and "Black & White" are available. Select "Standard" when using Postcard Printing Pack (UPC-2070E), Sticker Printing Pack (UPC-20S04, UPC-20S16), or Transfer Printing Pack (UPC-2050). Be sure to choose a ribbon type that matches the actual ribbon used in the printer. If they do not match, then an error message will appear when you try to print, and printing will stop.
Image Layout : "1 up", "4 up", and "16 up" are available. Use this setting when printing on Sticker Printing Pack (UPC-20S04, UPC-20S16).
The maximum printable pixels for each divide mode are as follows:
1UP 1365 x 1024
4UP 640 x 480
16UP 320 x 240
Current Status : Click to communicate with the printer and displays its status.
About : Click to display the version information of this driver.
Restore Defaults : Set the printer driver back to its defaults.

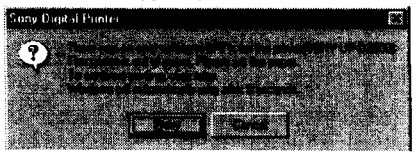
<Graphics Property>



Red, Green, Blue : Adjust each of the colors. Valid range is from -32 to +32.
Dark, Light : Set Dark and Light values. Valid range is from -32 to +32.
Sharp : Set the sharpness of image outline. Valid range is from 0 to 7. The higher the number, the more emphasized the outline will become.
Gamma : Adjust halftone. Valid range is from -32 to +32. The higher the number, the denser the halftone will become.
Quality : Select between "310 dots per inch" and "155 dots per inch." Selecting "155 dots per inch" will speed up printing at the cost of lower quality.
Scaling : Range is from 10% to 400%. Change the value here only if this is not possible in the print dialog of the application software. For such application software, changing the Scaling value here may not work.
Restore Defaults : Restore all settings of the "Graphics" property sheet to the factory defaults.

Error Messages

If an error occurs during printing, an error message will appear.



Error Message	Solution
No paper	: Make sure the paper tray is loaded with paper and inserted into the printer.
No ink ribbon	: Replenish ink ribbon and print again.
No ink ribbon cassette	: Insert the ink ribbon cassette.
Paper and ink ribbon not match	: Make sure the correct paper and ink ribbon are set.
Ink ribbon error	: The ink ribbon is broken or not recognized. Make sure the ink ribbon is set correctly.
Incorrect ribbon type setting	: The ribbon type specified in the printer driver does not match the actual ribbon in use. Check the printer driver properties and set the correct ribbon type, then print again.
Upper cover open	: Close the upper cover.
Paper feed error	: Paper could not be fed correctly. Remove the jammed paper from the paper tray.
Paper exit error	: Too many printouts are deposited at the paper exit area. Remove them.
Paper jam	: Remove the jammed paper and print again.
Overheat	: The print head is too hot. Wait until it cools down.
Stop key pressed	: Printing has stopped because the stop key on the printer was pressed.
Printer not ready	: Make sure the printer is plugged in to a power source and the printer cable correctly connected.
Motor or sensor error	: Turn off the printer, then turn it back on and print again.
Error source unknown	: Your PC cannot communicate with the printer correctly. Restart your PC as well as the printer and print again.

Before Consulting Your Dealer

Use the following list to troubleshoot the problem. Refer also to the documentations that came with your PC, the printer, as well as the application software. If the problem still continues, consult your dealer for assistance.

The printer image is larger than the image on the monitor.

- The display resolution is different from the printer resolution. If the application software in use allows for change in display resolution, set it to 310 dpi (UP-D2500's resolution). Or, if the print dialog accessible from the application software has "Printing to the printer resolution" option, select this option.
- Scaling may be set to a value other than 100%. Use the "Graphic" property sheet and make sure Scaling is set to 100%.

Strange color of printouts

- Use the "Graphic" property sheet and check the Color Adjust group settings. Make sure their values are set correctly.
- The Sharp setting on the "Graphics" property sheet is too big. When printing graphics, too big a value in Sharp may result in change of color; you can solve the problem by reducing the Sharp value.

Cannot print

- Make sure the printer is plugged into a power source and the cable correctly connected.
- Make sure the printer cable is IEEE1284-complaint; otherwise incorrect printing may result.
- Your PC does not support bi-directional Centronics. Check with the manufacturer of your PC to confirm. If this is true, open the Spool Settings dialog from the "Details" property sheet and select "Disable bi-directional support for this printer." Note that choosing this setting disables the ability to display detailed error information and in some cases continuos printing of multiple copies may not be possible.
- The LPT.VXD file in \Windows\System may be an old version that causes the printer port to function incorrectly. Therefore, be sure to obtain the latest version of this file.

Data transfer is slow despite connection in ECP mode

- Your PC may not support the ECP mode. Check with the manufacturer of your PC to confirm. If your PC does not support the ECP mode, the transfer rate will not increase even if "ECP Printer Port" is displayed in Control Panel – System – Device Manager – Ports.
- Your PC is not correctly set to the ECP mode. You need to change the BIOS settings in order to set the printer to the ECP mode. Also, depending on the model, you may need to change the printer port resource setting in Control Panel – System – Device Manager. For details, refer to your PC's documentation.

UP-D2500 Macintosh Printer Driver

Note **When using this software for Macintosh, the optional interface cable UPZ-2000M is required.**

*** Apple, Macintosh, Color QuickDraw, QuickDraw GX, AppleTalk, LaserWriter, and AppleShare are registered trademarks of Apple Computer Co.**

*** Windows95 is a registered trademark of Microsoft Corp.**

Before Using the Printer Chooser Driver

System Requirements

The following conditions are required for using this Macintosh Chooser Driver.

- Interface cable UPZ-2000M
- A Macintosh with 32-bit Color QuickDraw
- At least 8M bytes of free memory
- At least 8M bytes of free hard disk space on the system drive
- Macintosh OS 7.5 or later
- Apple Computer Co. "PC Exchange" control panel software

The driver operates faster if more free memory is available, so we recommend having as much memory as possible.

Note **This Macintosh Printer Chooser Driver does not support QuickDraw GX.**

Using the Chooser Driver

The Printer Chooser Driver is software that makes it possible to print to the UP-D2500 using the normal print function of general application software.

Installing the Chooser Driver

Install the Printer Chooser Driver by the following procedure.

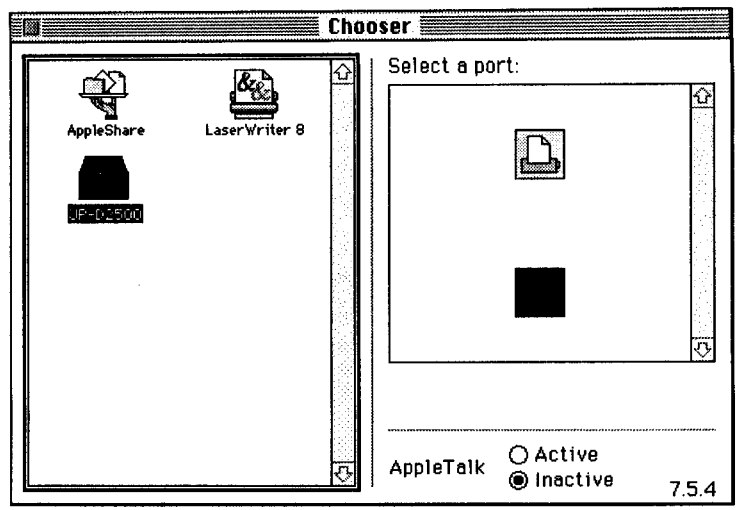
1. Insert the supplied "PRINTER CHOOSER LEVEL DRIVER for Macintosh" diskette into the Macintosh's floppy disk drive.
2. Double-click on the disk icon to open the disk window.
3. Double-click the "English" folder when using the English version, or the "Japanese" folder when using the Japanese version.
4. Drag the UP-D2500 icon into the Extensions folder in the System folder.
5. If you expect to do background printing, copy "UP-D2500.Background" to the hard disk. (It does not need to be placed in the system folder.)
6. Eject the "PRINTER CHOOSER LEVEL DRIVER for Macintosh" diskette and insert the "PRINTER COLOR TABLE for Windows95/Macintosh" diskette into the Macintosh's floppy disk drive. (If the disk icon does not appear on the desktop, check whether PC Exchange is installed on the Macintosh.)
7. Drag the D25STD1.MSK and D25LAM1.MSK icons into the system folder.

Printing

Using the Chooser to select the UP-D2500

Use the Chooser to select the UP-D2500 before printing with it the first time, and when switching back to the UP-D2500 after using to another printer.

1. Select "Chooser" from the Apple menu to display the Chooser window.



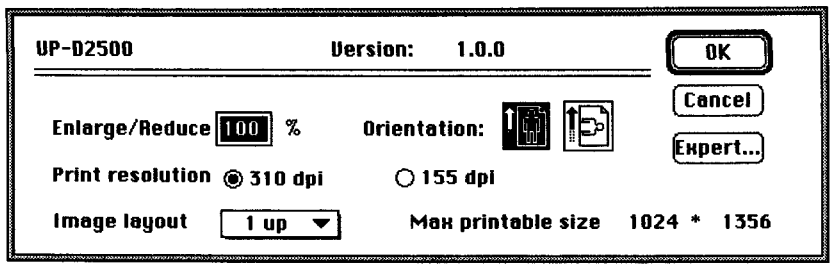
2. Select the UP-D2500 icon in the frame on the left side of the window.
3. In the window's right frame, select the icon that corresponds to the port to which the UPZ-2000M is connected. For the printer port, select the printer icon; for the modem port, select the modem icon.
4. Close the Chooser window.

Note **For the selected port, if AppleTalk is set to "Active," be sure to change it to "Inactive."**

Page Setup

Page Setup sets the enlarge/reduce ratio, print orientation, print resolution, and divide mode. When necessary, change these settings before you start printing.

1. Select "Page Setup" from the File menu. The paper settings dialog appears.



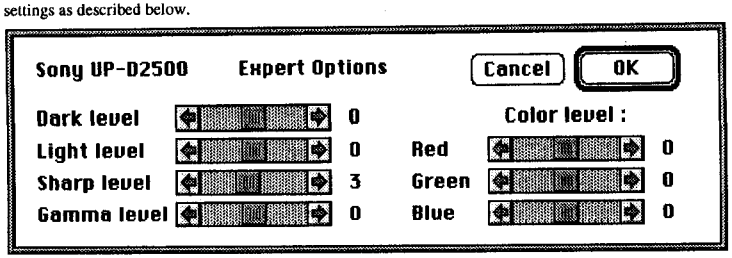
2. See below to set the selection items as required.
3. Confirm your settings and click the "OK" button to close the dialog box.

About the Page Setup Items

Page Setup dialog box selections are described below.

- Enlarge/Reduce
  Enter the desired magnification or reduction percentage from the keyboard. You can enter any whole number between 25 and 400 (%). For example, if the image you are printing is larger than the paper in the printer, you can reduce the image so that it will fit.
  The printed image is magnified or reduced by the specified percentage both vertically and horizontally. For example, specifying 200% produces a printed image of twice the height and twice the width of the size specified in the software, so the printed image has four times the area.
- Orientation
  Specifies whether the image is to be printed in tall (portrait) or wide (landscape) orientation.
- Print resolution
  Specifies the print resolution. You can select either 310 dpi or 155 dpi.
- Image layout
  Specifies the divide mode: "1up", "4up", or "16up". The "Max printable size" numbers indicate the maximum printable pixels for each page in the current divide mode. If the print resolution is set to 155 dpi, however, then the divide mode will be automatically fixed at "1up."

- Clicking the "Expert" button displays the following dialog box appears, allowing you to make settings as described below.

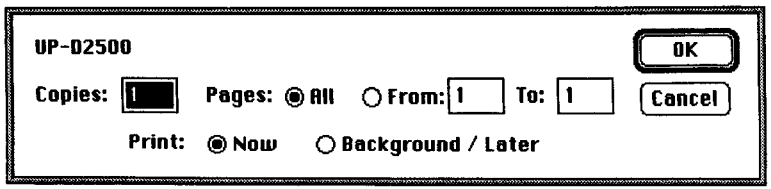


The Dark level slider adjusts the black level, and the Light level slider adjusts the white level. These sliders can be set to levels between -32 and +32.
The Sharp level slider adjusts the sharpness of edges of objects in the printed image. This slider can be set to levels between 0 and +7.
The Gamma level slider adjusts the contrast curve. This slider can be set to levels between -32 and +32.
The Red, Green, and Blue Color level sliders adjust the level of the respective color, from -7 to +7.

Printing

Use the following procedure to print from an application to the UP-D2500.

1. Select "Print" from the File menu to display the print dialog box.



2. See the next section below to change the settings as required.
3. Click "OK" to start printing. Click "Cancel" if you want to cancel printing.

About the Print Setup Items

Print dialog box selections are described below.

- Copies
  Specifies how many copies to print.
- Pages
  Specifies which pages to print.
  "All" selects all pages of the current document open under the application.
  "From" and "To" specify printing the range of pages between the specified values. Page numbers are entered from the keyboard.
- Print
  Specifies the print timing.
  "Now" causes the document to print as soon as you click "OK."
  "Background / Later" starts background printing when you click "OK"

Background Printing

Printing with this driver is usually done in the foreground, so the computer cannot be used for other work while printing. However, you may want to be able to work in the foreground while printing in the background; for example, to write a manuscript for a speech while printing images for slides. You would use background printing to do this.

System Environment for Background Printing

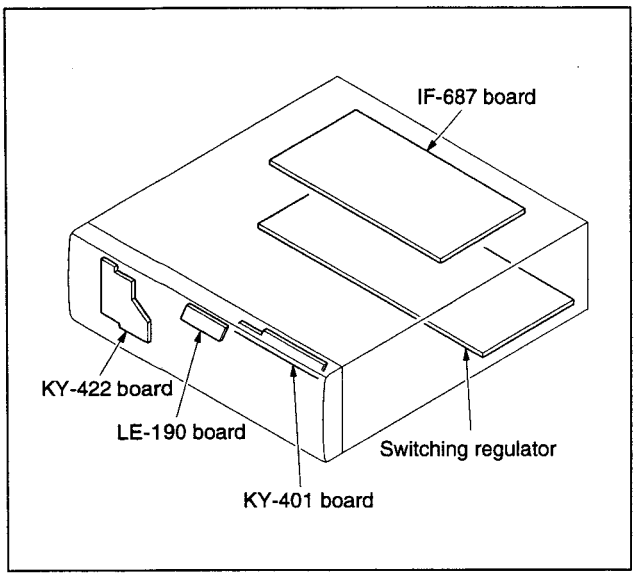
During background printing, UP-D2500.Background is used together with the Chooser Driver, the same system requirements pertain as when using the Chooser Driver by itself. Additionally, there must be at least 8M bytes of real memory (not virtual memory) available for use by UP-D2500.Background, and sufficient free space on the hard disk for spooling of the document being printed. (The specific space requirement varies according to the size of the document, and may be as great as 5M bytes per page.)

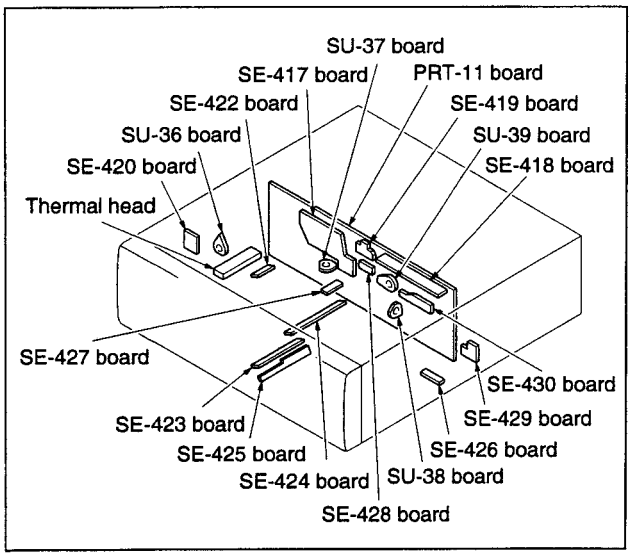
Outline of Operation

When UP-D2500.Background is loaded, printing from an application copies the document to a spool file. With foreground printing, printing starts immediately, and the application cannot be used until printing finishes. With background printing, the application can be used again as soon as creation of the spool file is completed. The spool file is automatically deleted once printing is done.

SECTION 2
SERVICE INFORMATION

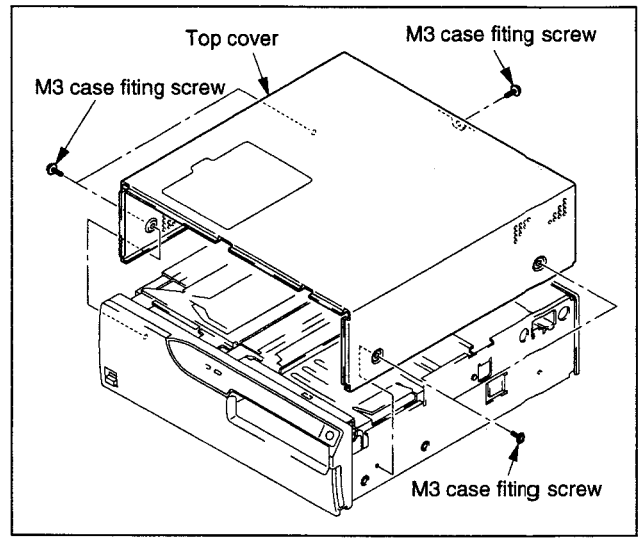
2-1. BOARD LAYOUT





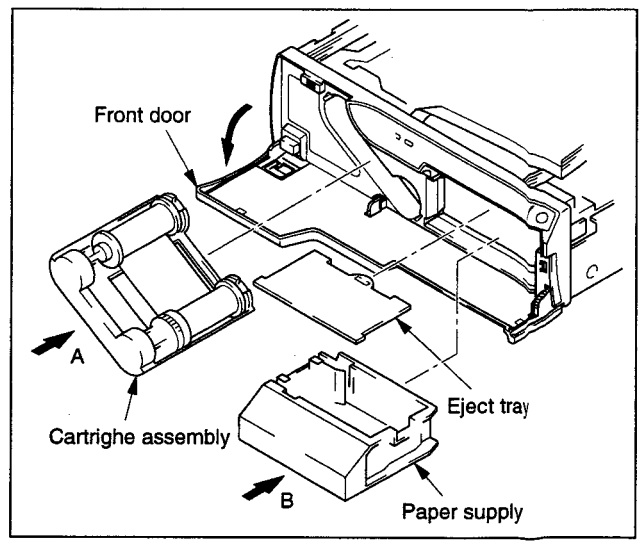
2-2. DISASSEMBLY

2-2-1. Removal of the Top Cover



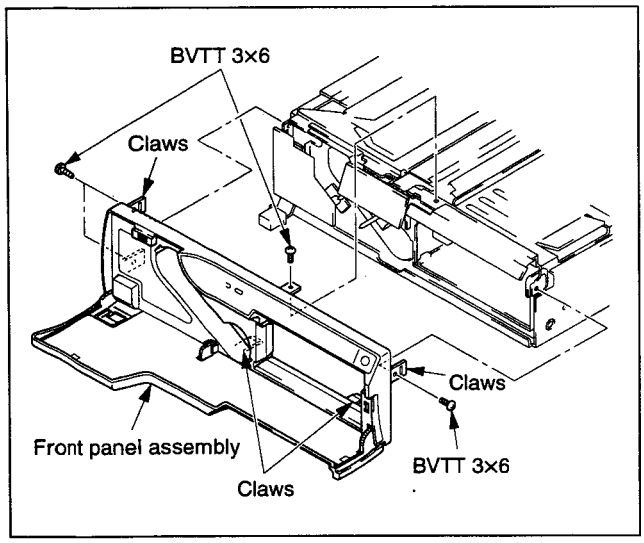
2-2-2. Removal of the Front Panel Assembly

1.



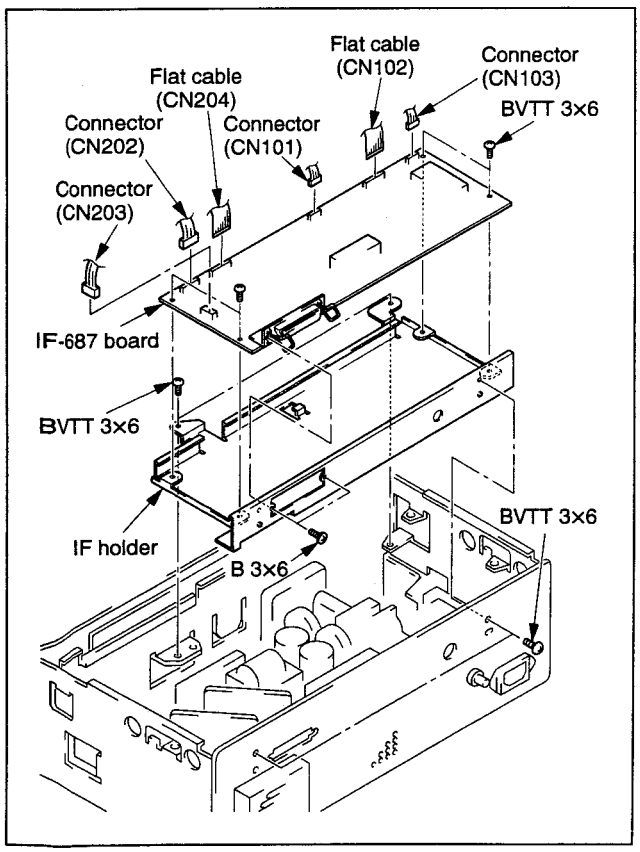
Note : Push the cartridge assembly and paper supply tray in the direction indicated by arrow A or B, then take out them.

2.

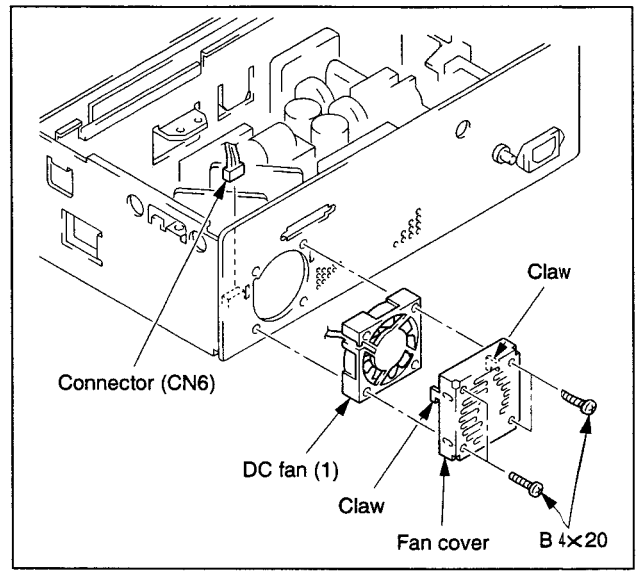


Note : Remove the four claws, the remove the front panel assembly.

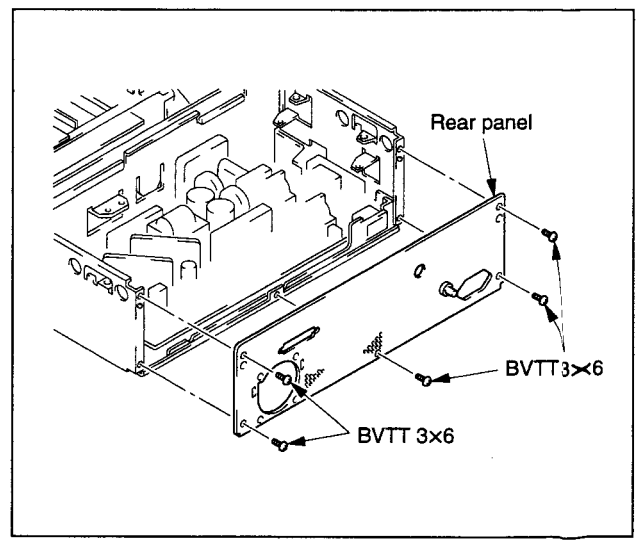
2-2-3. Removal of the IF-687 Board



2-2-4. Removal of the DC Fan (1)

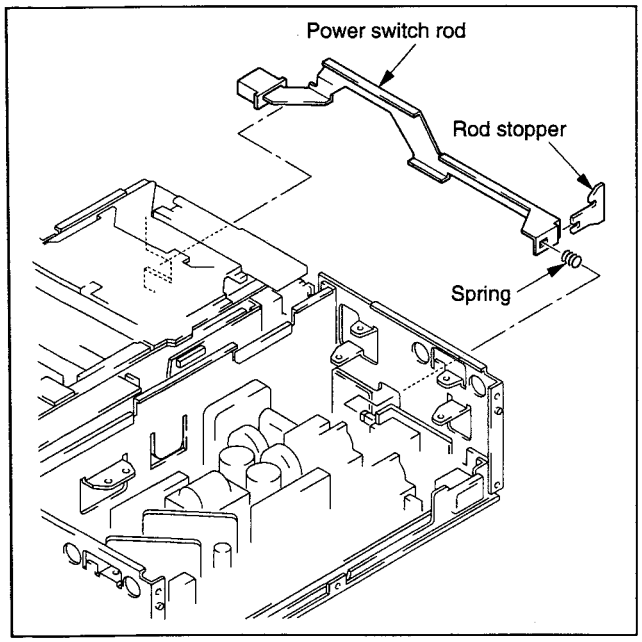


2-2-5. Removal of the Rear Panel

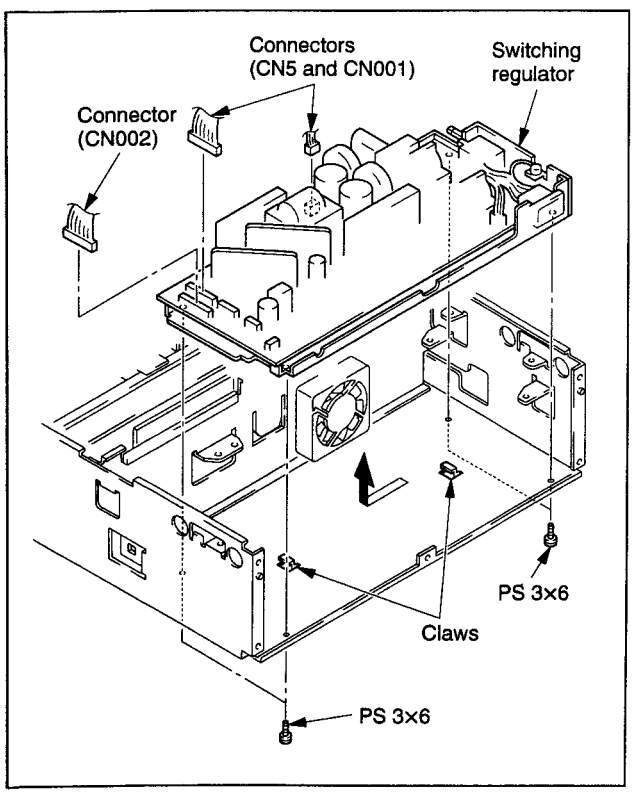


2-2-6. Removal of the Switching Regulator

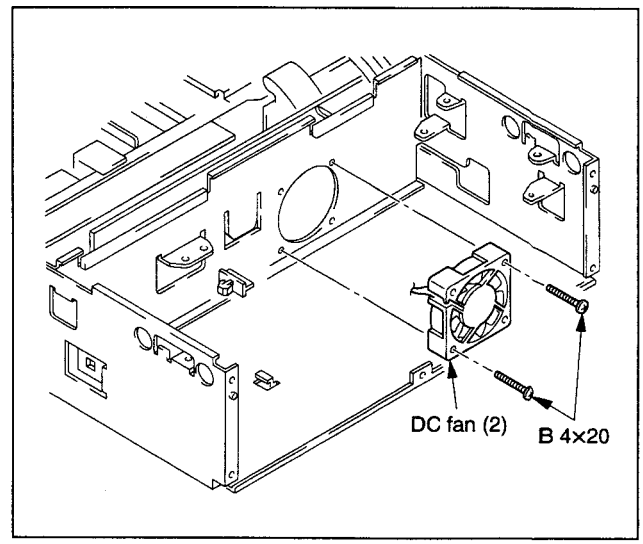
1.



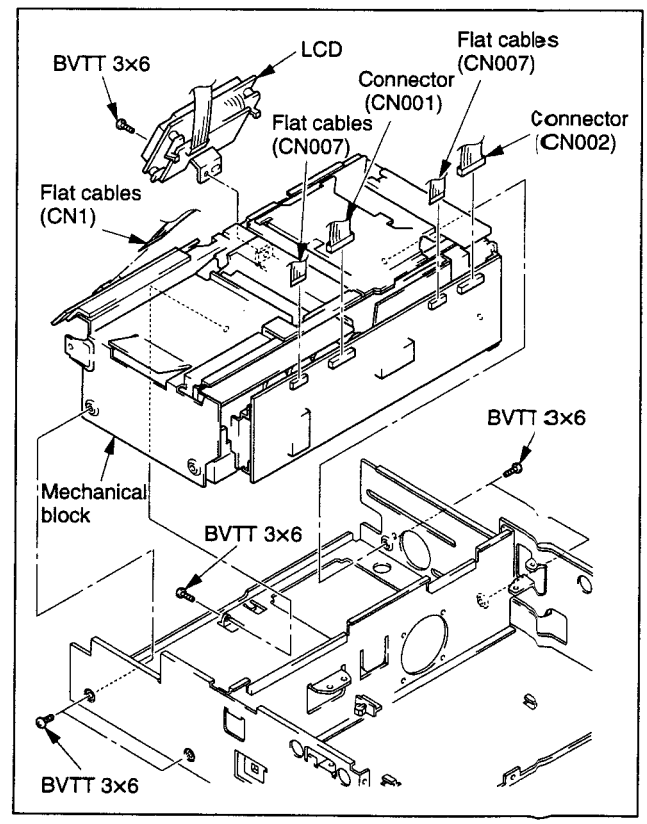
2.



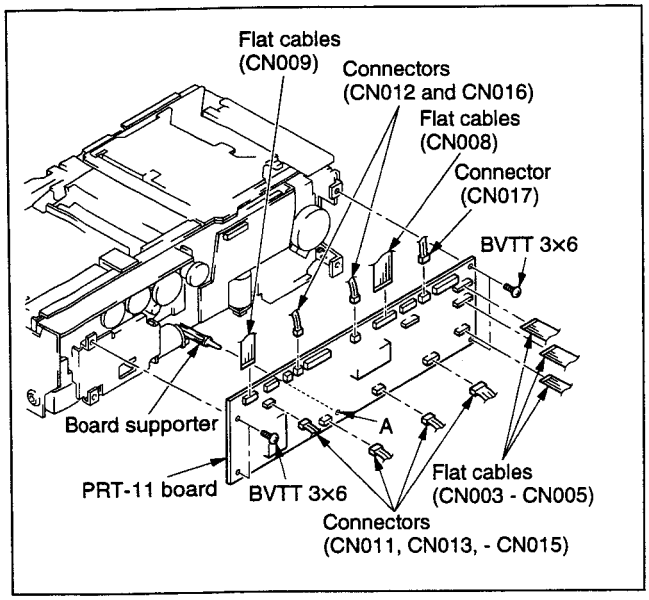
2-2-7. Removal of the DC Fan (2)



2-2-8. Removal of the Mechanical Block



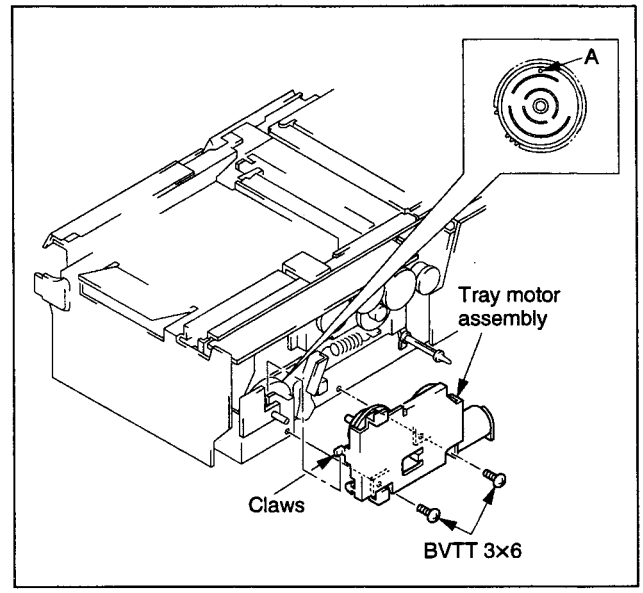
2-2-9. Removal of the PRT-11 Board



Note : When installing the PRT-11 board, insert the board supporter to the hole A of the board.

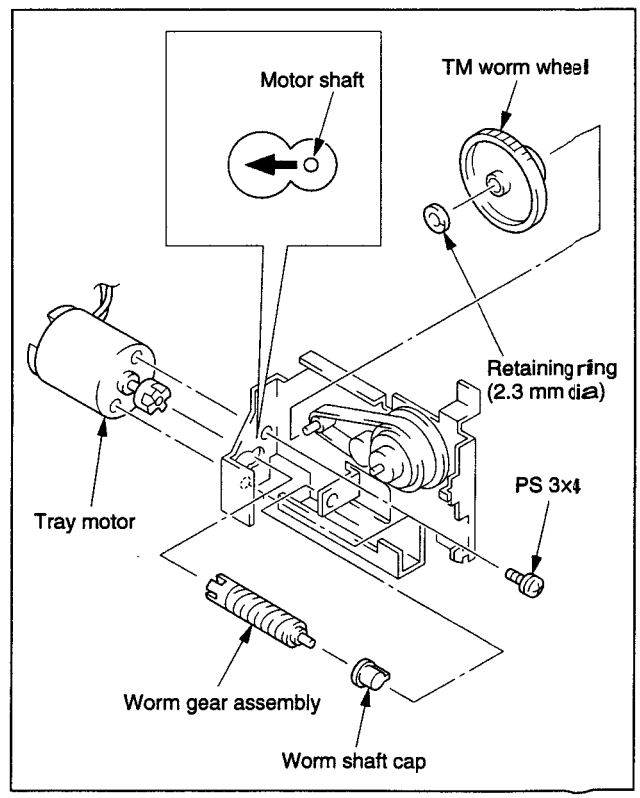
2-2-10. Removal of the Tray Motor

1.



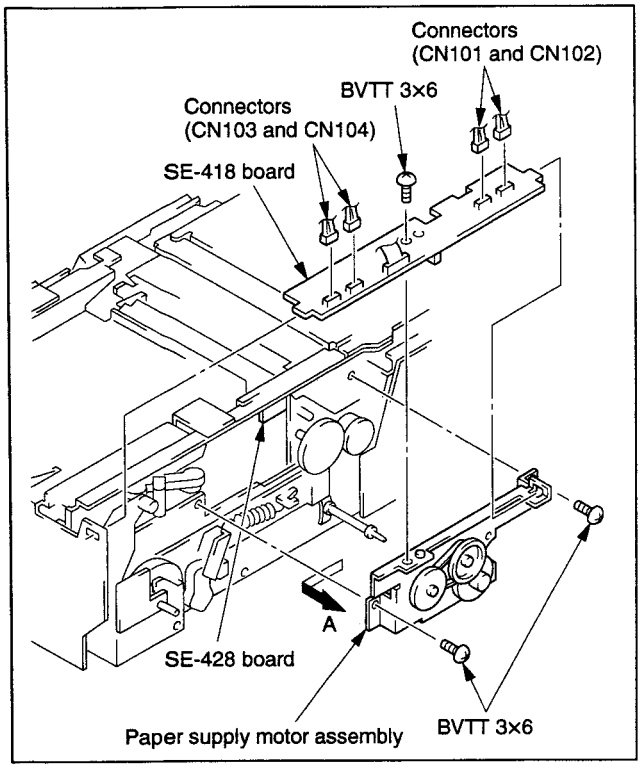
Note : When attaching tray motor cam assembly, make sure that the hole of A is placed at the top position.

2.



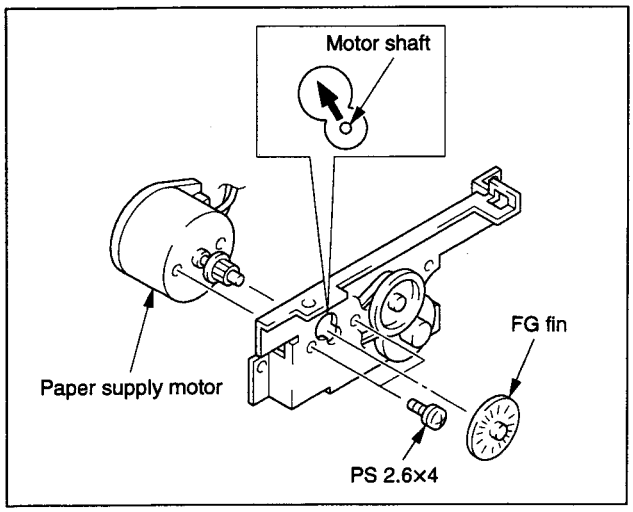
2-2-11. Removal of the SE-418 Board and Paper Supply Motor

1.



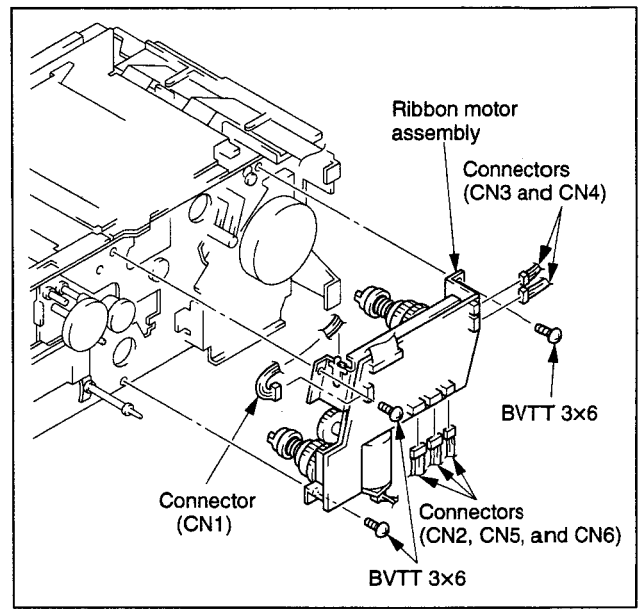
Notes : When removing the paper supply motor assembly, remove it in the direction indicated by arrow A so as not to strike the SE-428 board.

2.

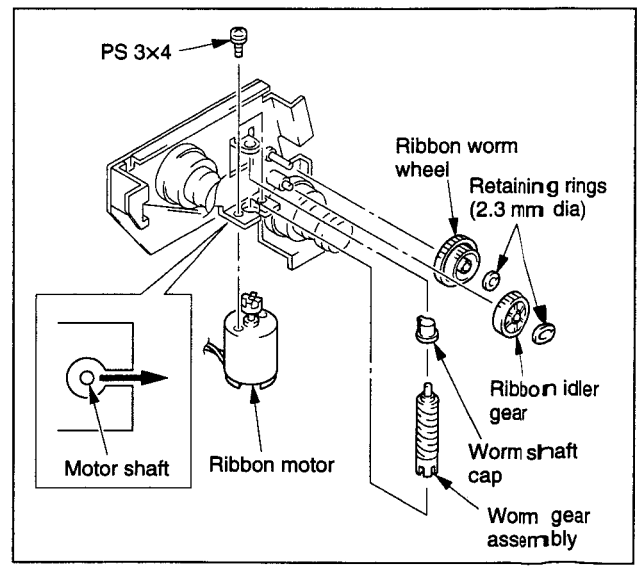


2-2-12. Removal of the Ribbon Motor

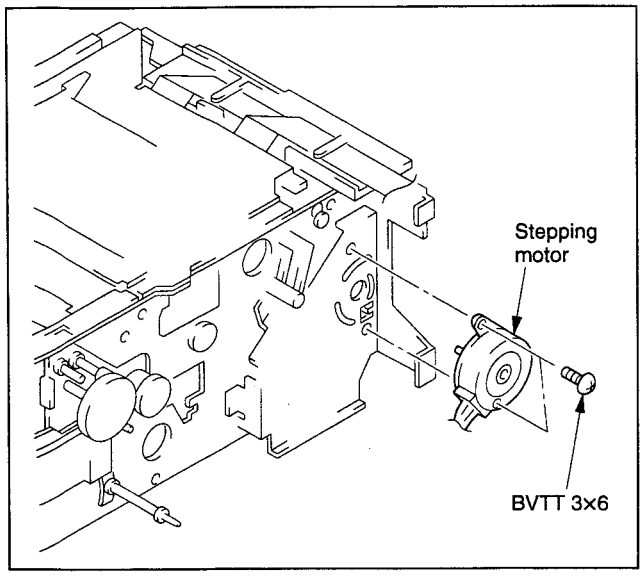
1.



2.

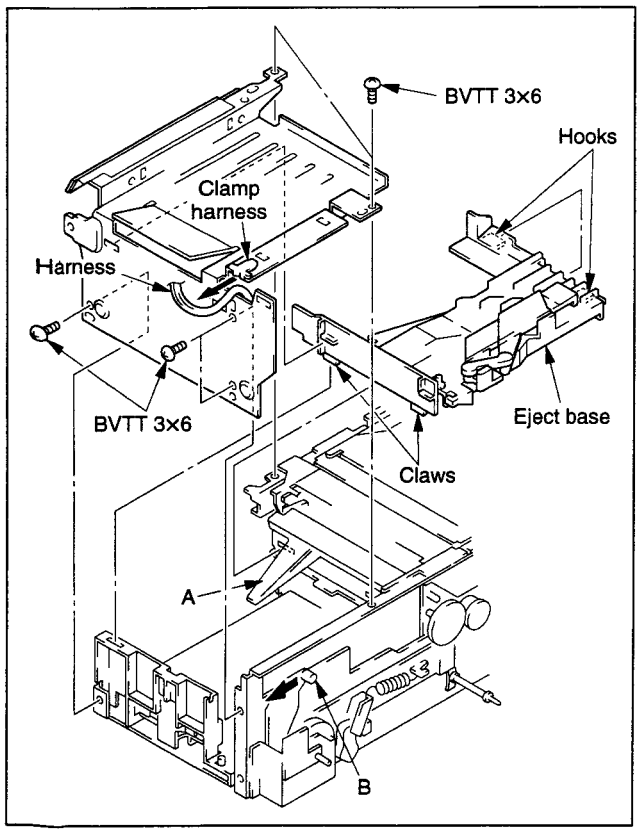


2-2-13. Removal of the Stepping Motor



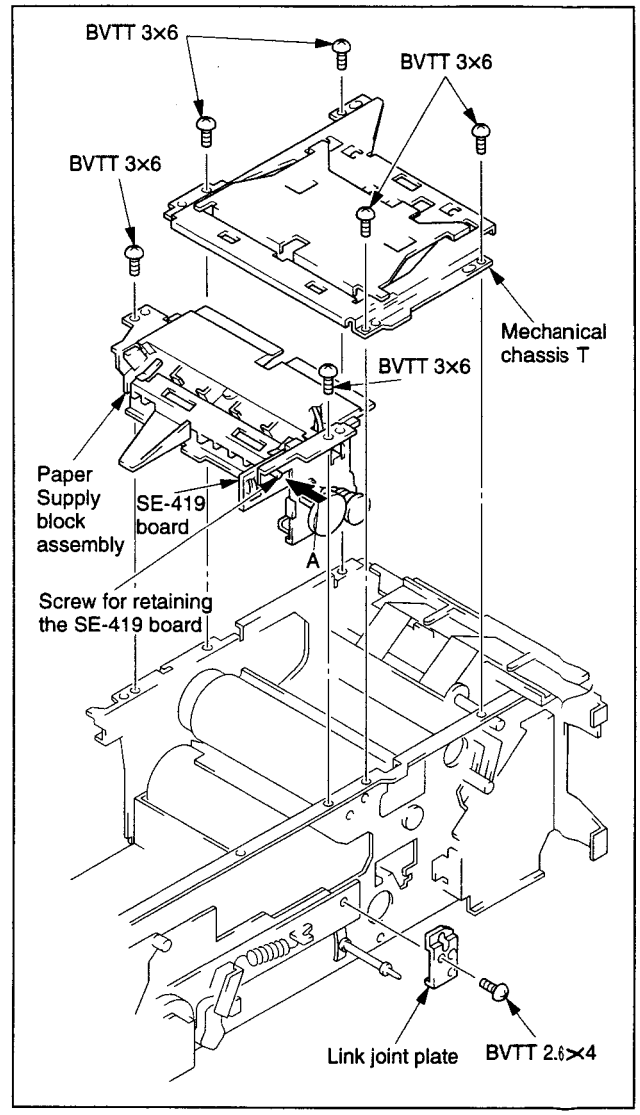
2-2-14. Removal of the Load Block Assembly

1.



Note : 1. When removing or attaching the eject base, perform it while portion A is lifted.
2. When attaching the eject base, push portion B in the direction shown by the arrow.

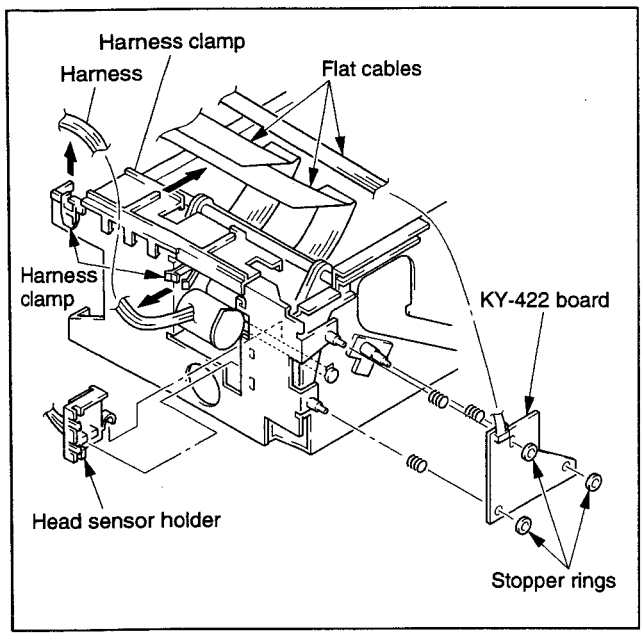
2.



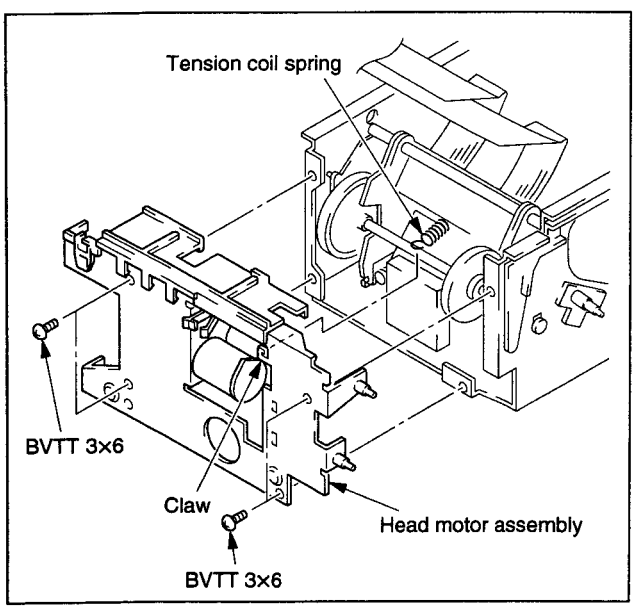
Note : When removing paper supply block, remove the screw for retaining the SE-419 board while pushing it in the direction shown by the arrow.

2-2-15. Removal of the Head Motor

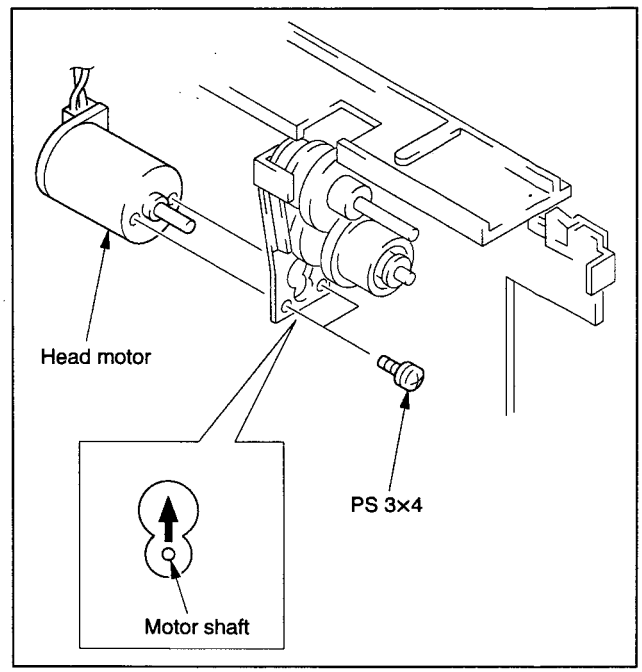
1.



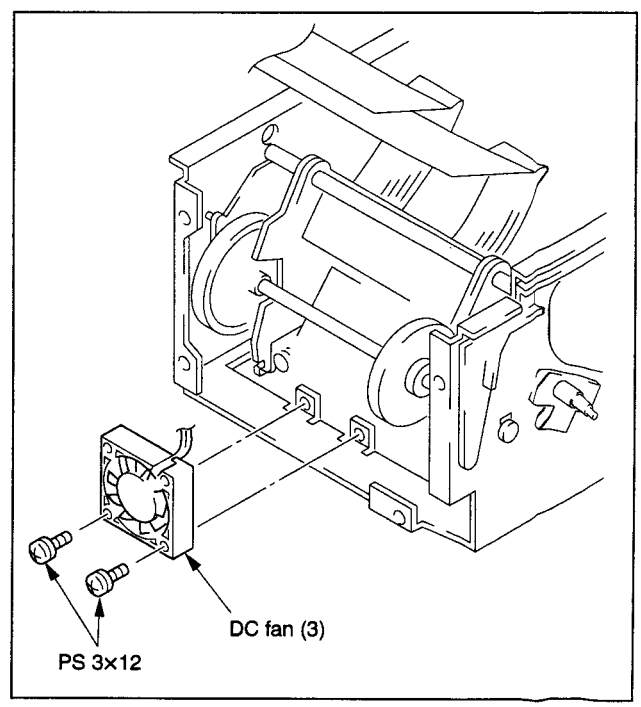
2.



3.

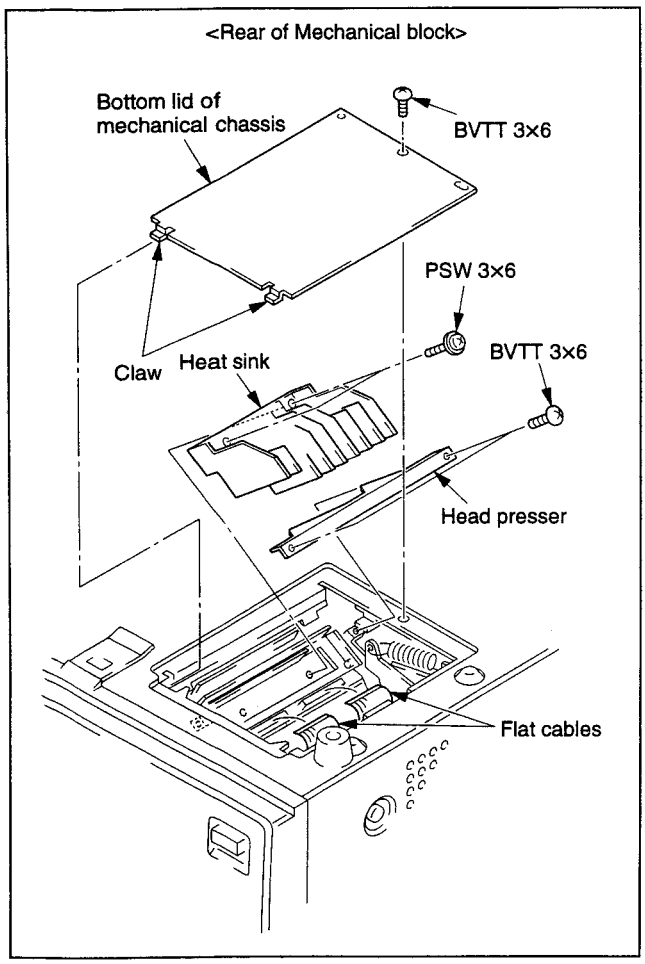


2-2-16. Removal of the DC Fan (3)

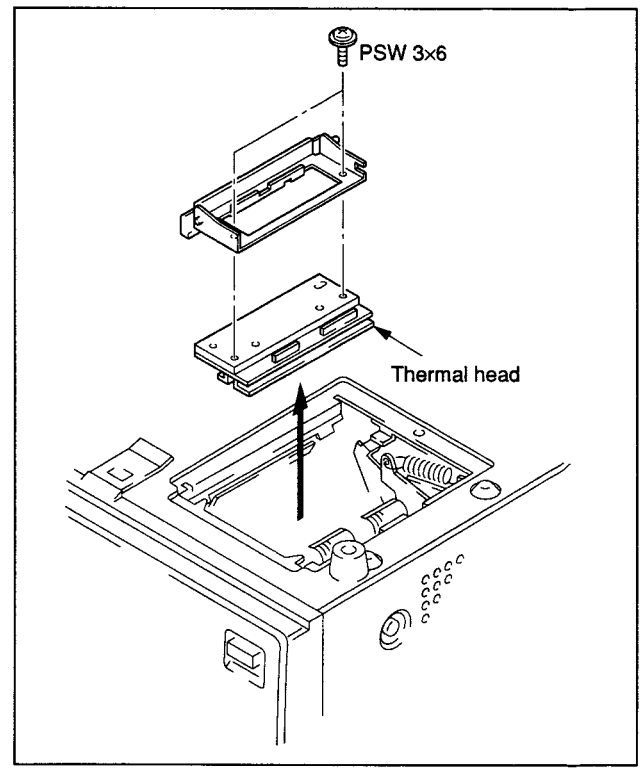


2-3. REPLACEMENT OF THERMAL HEAD

1.



2.



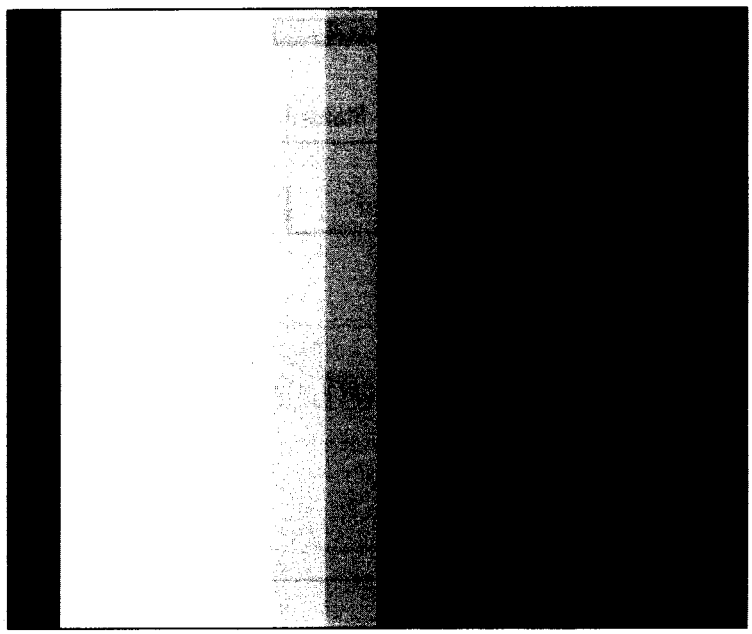
SECTION 3
ELECTRICAL AND MECHANICAL ALIGNMENT

3-1. PRINTING BUILT-IN TEST PATTERNS (STAIR-STEP)

The UP-D2500/UP-D2550 has a function to print test patterns (stair-step) by itself.
This is the easiest method of checking printing.

1. Set the ribbon and paper.
2. Remove the black shielding seal on the right side of the rear panel.
3. Push the switch on the internal board (S207 of the IF-687 board) using a ball-point pen.

<Note> **Since the UP-D2500 (For UC and CE) does not incorporate a masking memory, the actual colors cannot be obtained when built-in patterns are printed (the masking process is performed by the driver software).**
However the UP-D2550 (For J) is able to produce the actual colors as it incorporates the masking memory.



3-2. PREPARATIONS BEFORE ADJUSTMENTS

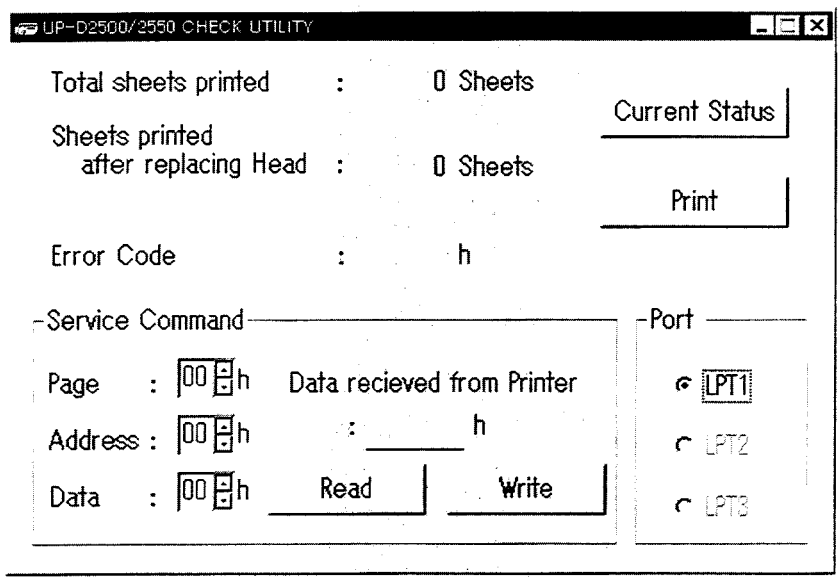
One of the following servicing tool (1) or (2) is required for adjustments.

(1) UP-D2500/2550 servicing tool software
CheckD25.exe (J-9000-360-A)

(2) LED display
PDSP2113 (green) (8-749-922-58)
or substitute
PDSP2111 (yellow) (8-749-922-56)
PDSP2112 (red) (8-749-922-57)

3-2-1. UP-D2500/2550 Servicing Tool Software Using the CheckD25. exe (J-9000-360-A)

Adjustments can be performed using the Window'95 PC



System required

Personal computer : Personal computer with parallel port for interactive communication
OS : Windows 95
Printer cable : Cable conforming to IEEE STD 1284
Recommended product Hewett Packard C2950A or C2951A

(1) Current Status

Click to display the current status of the printer.

Displays the total number of printed sheets, number of printed sheets after replacement of head, and error codes.

(2) Print

Print button. As the UP-D2500 (For UC and CE) does not have a print button, click this when printing without using the printer driver.

(3) Error Code

Information on mechanical deck errors

Displays the latest error information during mechanical operations. The contents correspond to the NG_CODE1 data.

(4) Service Command

Writes and reads service commands to the printer.

Use the service commands to perform electrical and mechanical adjustments.

<Note> Do not perform writing operations other than the writing of the service commands described in this manual, or errors may occur in the worst case.

(5) Port

Used to set the printer port used on the personal computer.

<Note>

1) **This service software is run using the interactive communication function of the parallel interface.**
   When using it, set the printer port of the personal computer to the interactive communication mode (Compatible-Nibble mode or ECP mode).
   For details of how to set, refer to the instruction manual for the personal computer.
   (Normally the default setting of the personal computer is the interactive communication mode.)

2) **In the Compatible-Nibble mode, due to the structure, the printer cannot communicate in error states.**
   It can operate only in the error-free states (when all LEDs on the front panel are OFF).

3) **In the ECP mode, the printer can be used even in error states by setting the printer port of the personal computer to the ECP mode. (However the ECP mode may not operate for some personal computers. For details, refer to the instruction manual for the personal computer. Details are also provided in the instructional manual for the printer driver provided with the UP-D2500/2550.)**

3-2-2. Using the LED Display PDSP2113 (8-749-922-58)

If a personal computer is not available, service commands can be written and read using the LED display PDSP2113.

(1) As the PDSP2113 lead pin may break, use the IC socket 28P (1-526-659-21, etc.) as much as possible.
(2) With the power off, insert the PDSP2113 into ICI212 of the IF-687 board.
(3) When the power is turned ON, the current state of the printer is displayed after UP-D2500/2550 is displayed.
[UP-D2500] → [P ER ST0] (Means PRT error status 0)
(For UC and CE)
[UP-D2550]
(For J)
(4) Use S201 through S206 of the IF-687 board.
1. [PAGE] S201 Used for switching pages. The page changes with each press.

Display of printer status
↓
Service command page 1 [01 00 00]
Page Address Data
↓
Service command page 2 (Do not use this.)
↓
Service command page 3 [03 00 00]
↓
Service command page 4 [04 00 00]
↓
Service command page 5 [05 00 00]
↓
Built-in test pattern write command [1 S STEP] = Stair-step
(The pattern can be changed using the ADDR+/- key.)
↓
Display of total number of printed sheets [TO (Displayed in decimal)]
↓
Display of number of printed sheets after replacing head [HE (Displayed in decimal)]

2. [ADDR-] S202 [ADDR+] S203 Increases/decreases the address

3. [DATA-] S204 [DATA+] S205 Increases/decreases the data

4. [EXEC] S206 Execute Used to write the command.

<Note> Do not perform writing operations other than the writing of service commands described in this manual, or errors may occur in the worst case.

List of Service Commands

PAGE	ADDRESS	Function	R/W	Remarks
1	01h	ROM version	R	
1	03h	Key code reading	R	
1	06h	Reception value at E0	R	
1	09h	Ribbon type	R	Valid after finalizing ribbon code
1	0Ah	Ribbon remainder	R	Valid after finalizing ribbon code
1	0Bh	Head temperature	R	
1	14h	Program construction (Month)	R	
1	15h	Program construction (Day)	R	
1	18h	Reception value at E2	R	For mechanical control tool
1	19h	Reception value at E3	R	For mechanical control tool
1	1Ah	Reception value at E4	R	For mechanical control tool
1	1Bh	Reception value at E5	R	For mechanical control tool
1	26h	sensor 0 (Ribbon cd0 light emission level)	R	For mechanical control tool
1	27h	sensor 1 (Ribbon cd0 high level)	R	For mechanical control tool
1	28h	sensor 2 (Ribbon cd0 low level)	R	For mechanical control tool
1	29h	sensor 3 (Ribbon cd0 threshold)	R	For mechanical control tool
1	2Ah	sensor 4 (Ribbon cd1 light emission level)	R	For mechanical control tool
1	2Bh	sensor 5 (Ribbon cd1 high level)	R	For mechanical control tool
1	2Ch	sensor 6 (Ribbon cd1 low level)	R	For mechanical control tool
1	2Dh	sensor 7 (Ribbon cd1 threshold)	R	For mechanical control tool
1	2Eh	sensor 8 (Barcode light emission level)	R	For mechanical control tool
1	2Fh	sensor 9 (Barcode high level)	R	For mechanical control tool
1	30h	sensor a (Barcode low level)	R	For mechanical control tool
1	31h	sensor b (Barcode threshold)	R	For mechanical control tool
1	32h	sensor c (Paper Jam light emission level)	R	For mechanical control tool
1	33h	sensor d (Paper Jam high level)	R	For mechanical control tool
1	34h	sensor e (Paper Jam low level)	R	For mechanical control tool
1	35h	sensor f (Paper Jam threshold)	R	For mechanical control tool
		Mechanism control tool command		
1	3Fh	Head voltage adjustment command	R/W	Data is voltage setting parameter
1	4Fh	Sensor value request command	W	Select sensor by DATA (00h to 0Fh)
1	81h	Serial communication check	W	Command for mechanical control tool
1	82h	Sensor check 1	W	Command for mechanical control tool
1	83h	Thermistor check	W	Command for mechanical control tool
1	84h	EEPROM check	W	Command for mechanical control tool
1	85h	Thermistor EEPROM check	W	Command for mechanical control tool
1	86h	Head home check	W	Command for mechanical control tool
1	87h	Tray home check	W	Command for mechanical control tool
1	88h	Platen home check	W	Command for mechanical control tool
1	89h	FG check	W	Command for mechanical control tool
1	8Ah	Ribbon check (BARCODE)	W	Command for mechanical control tool
1	8Bh	Ribbon check (RBN CD)	W	Command for mechanical control tool
1	8Ch	Print check	W	Command for mechanical control tool

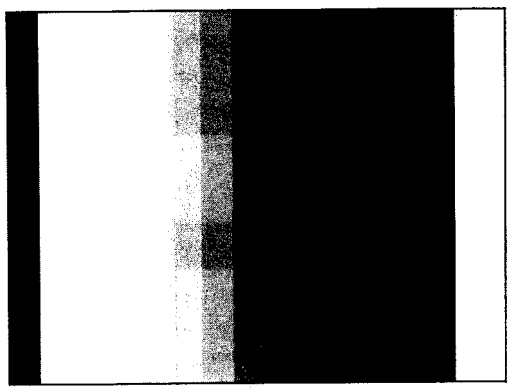
3		EEPROM contents	R/W	
3	05h	Head voltage parameter	R/W	
3	07h	E1 error history data 0	R/W	NG-CODE1 reception value (Memory)
3	0Ah	Total number of printed sheets (L)	R/W	
3	0Bh	Total number of printed sheets (H)	R/W	
3	0Ch	Number of printed sheets after replacement of head (L)	R/W	
3	0Dh	Number of printed sheets after replacement of head (H)	R/W	
4	05h	Alarm LED lighting	R/W	1:Lights, 0:Off
4	06h	Print LED lighting	R/W	1:Lights, 0:Off
4	0Fh	Remaining number of printed sheets	R	Continuous printing
4	10h	Number of printed sheets set	R/W	Continuous printing
4	14h	no bell	R/W	1:Bell is not rung
4	15h	Paper LED lighting	R/W	1:Lights, 0:Off
4	16h	Ribbon LED lighting	R/W	1:Lights, 0:Off
4	17h	Ring bell once	W	
4	18h	Ring bell three times	W	
4	20h	Switching between 1-screen unit/3-screen unit	R/W	1:1-screen, 0:3-screen
4	23h	Number of printed sheets after replacing head	W	
4	24h	Image data bus check	W	
4	39h	Reception data at E1	R	For mechanical control tool
1	40h	40h E1 error history data 0	R	For mechanical control tool
1	41h	41h E1 error history data 1	R	For mechanical control tool
1	42h	42h E1 error history data 2	R	For mechanical control tool
1	43h	43h E1 error history data 3	R	For mechanical control tool
1	44h	44h E1 error history data 4	R	For mechanical control tool
1	45h	45h E1 error history data 5	R	For mechanical control tool
1	46h	46h E1 error history data 6	R	For mechanical control tool
1	47h	47h E1 error history data 7	R	For mechanical control tool
1	5Fh	5Fh error history command	W	Command for mechanical control tool
5	15h	DRAM CHECK	W	OK:1 bell, NG:3 bells
6		Test pattern		
6	00h	Stair-step	W	
6	01h	Color bar	W	
6	02h	Ramp	W	
6	03h	All black	W	
6	04h	All gray	W	
6	05h	Two-tone gray	W	
6	06h	Side bar	W	
6	07h	Crosshatch	W	
6	08h	Side bar (Up)	W	
6	09h	Side bar (Down)	W	
6	0Ah	Window	W	

3-3. PRINTING THE BUILT-IN TEST PATTERN

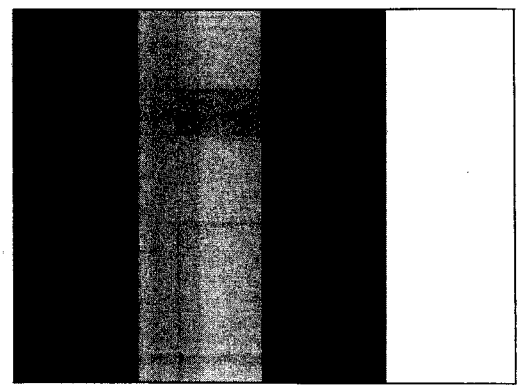
Write the 11 test patterns incorporated in the printer into the memory using [PAGE 6] of Service Commands.

(1) Set to PAGE 6 ADR 00H through 0AH.

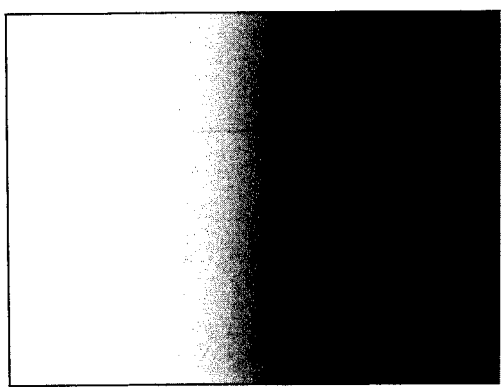
00H Stair-step



01H Color bar

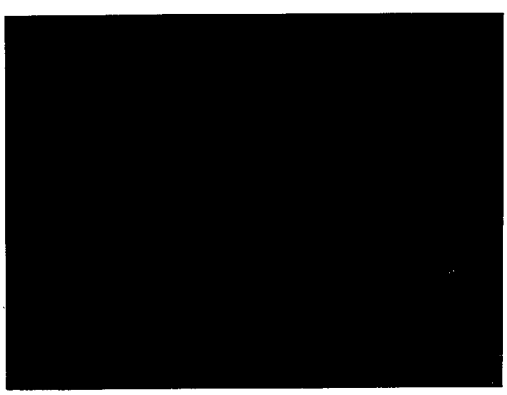


02H Ramp

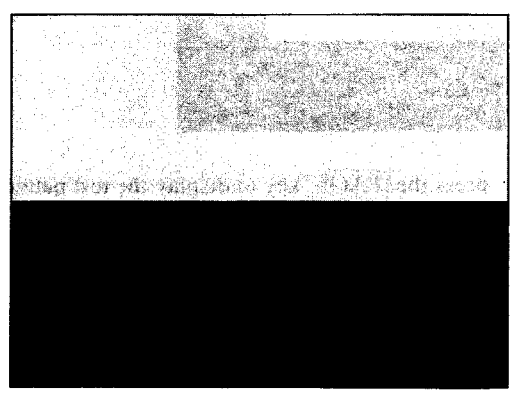


03H All black

04H All gray

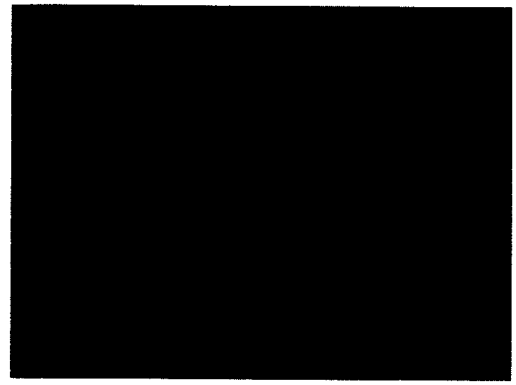


05H Two-tone gray

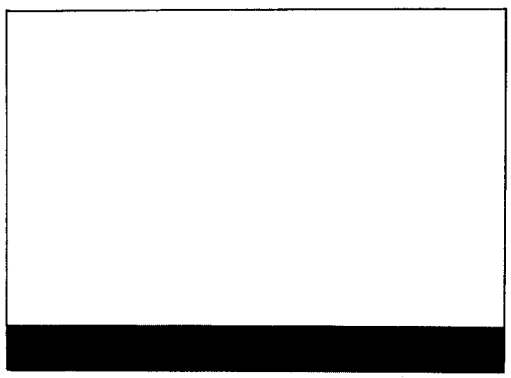


06H Side bar

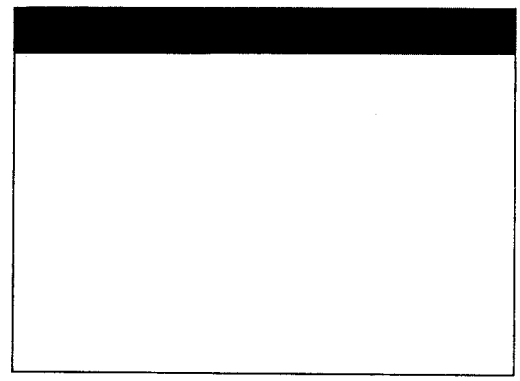
07H Crosshatch



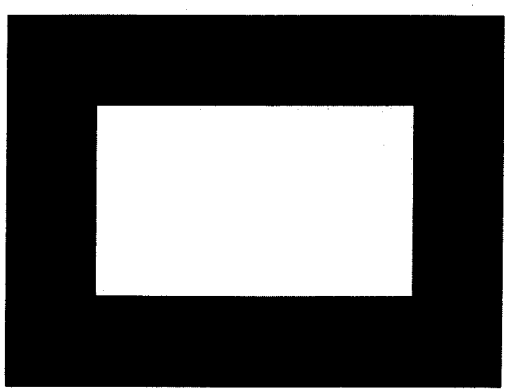
08H Side bar (Up)



09H Side bar (Down)



0AH Window



(At the LED display, press the PAGE key to display the test pattern.)

(2) Click WRITE.
(Click EXEC at the LED display.)

(3) Click PRINT of the servicing tool software.
The UP-D2550 (For J) can also be operated using the print key on it.

<Note> Since the UP-D2500 (For UC and CE) does not incorporate a masking memory, the actual colors cannot be obtained when built-in patterns are printed (the masking process is performed by the driver software).
However the UP-D2550 (For J) is able to produce the actual colors as it incorporates the masking memory.

3-4. ADJUSTMENTS WHEN THERMAL HEAD IS REPLACED

(1) Print the built-in stair-step pattern before replacing the thermal head. Use the print results as referred for the density adjustment.
(2) Replace the thermal head.
(3) After replacing, print the stair-step pattern again.
Compare with the print results before replacement, and adjust the density if the density differs.
(4) Reset the number of printed sheets after replacing the head.

To adjust the density;

1. Set the service command [PAGE 1] [ADR 3FH].
2. When using the servicing tool software, click [READ] to display the current data.
When using the LED display, the data will already be displayed.
3. When the data is increased, the density becomes thinkers.
Adjust to the desired value, and press [WRITE] if using the servicing tool software, and [EXEC] if using the LED display.
4. Print the stair-step, and repeat the adjustment until the same density as the reference is obtained.

To reset the number of printed sheets after replacement of head

1. Set the service command [PAGE 4] [ADR 23H].
2. If using the servicing tool software, press [WRITE]. If using the LED display, press [EXEC].
The data need not be set.

3-5. MAIN SERVICE COMMANDS (EXCLUDING MECHANICAL ADJUSTMENTS)

<EXEC> indicates the WRITE command.

1. Head voltage adjustment
   <Contents> The head voltage increases when the DATA value is increased.
   [PAGE1] [ADR3FH] [DATA**H] R/W

2. Front LED lighting check
   [PAGE4] [ADR06H] R/W Print LED
   [PAGE4] [ADR05H] R/W Alarm LED
   [PAGE4] [ADR16H] R/W Ribbon LED
   [PAGE4] [ADR15H] R/W Paper LED
   Lights with [DATA 01H]
   Goes off with [DATA 00H]

3. Display of reminding number of printed sheets
   <Contents> Displays the number of printed sheets remaining in continuous printing.
   [PAGE4] [ADR0FH] [DATA**H] Hexadecimal display R

4. Setting of number of continuous printed sheets
   <Contents> Sets the number of printed sheets to be printed in continuous printing.
   [PAGE4] [ADR10H] [DATA**H] Hexadecimal display R/W

5. Bell muting
   <Contents> The bell will not ring. Rings again when power is turned on and then off.
   [PAGE4] [ADR14H] [DATA01H] R/W

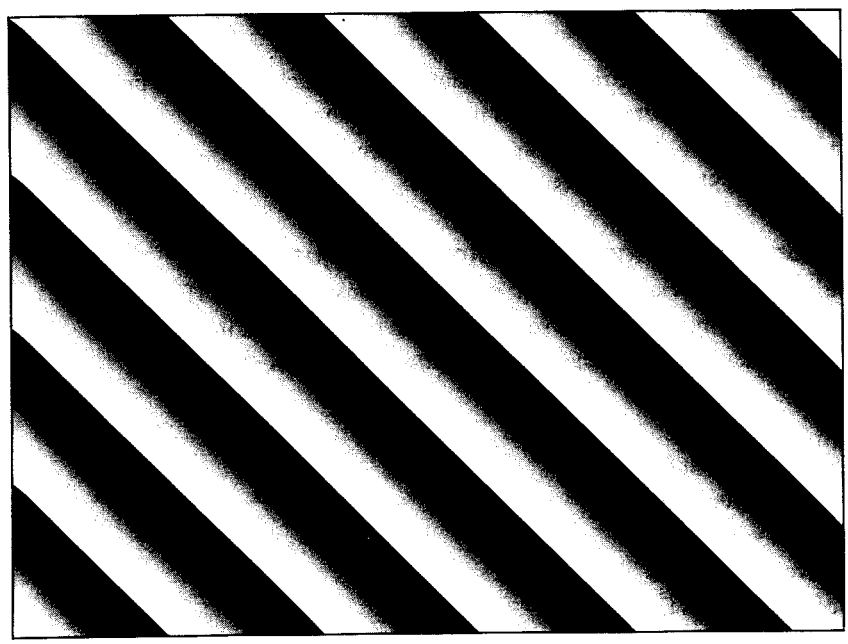
6. Bell check
   [PAGE4] [ADR17H] [EXEC] W Bell rings once
   [PAGE4] [ADR18H] [EXEC] W Bell rings three times

7. Reset of number of printed sheets after replacing head
   <Contents> The number of printed sheets after replacing head is set to 0.
   [PAGE4] [ADR23H] [EXEC] W

8. Image data bus check

<Contents> Prints one sheet of slanting ramp patterns for checking the image data bus. Errors in the image data bus can be discovered using this pattern.

PAGE4 ADR24H [EXEC] W



9. DRAM check

<Contents> Performed if the results of printing the built-in test patterns are NG. This command checks IC102, IC107, IC108, and IC101 of the IF-687 board. If the result is OK after the command is executed, the PRT-11 board may be faulty.

PAGE5 ADR15H [EXEC] W

OK : 1 bell, NG : 3 bells

3-6. MECHANICAL ADJUSTMENT

3-6-1. Mechanical Adjustment Mode

- This mode is used to adjust the electric boards (PRT-11, SE-417 through SE-430, and SU-36 through SU-39 boards) mounted on the mechanical deck and confirm the assembling of mechanical parts.
- Perform the mechanical adjustment when the electric boards mounted on the mechanical deck or the mechanical deck parts were replaced. (Especially, various information items on the mechanical deck are stored in IC1 on the SE-417 board. Be sure to perform the whole mechanical adjustment after IC1 on the SE-417 board is replaced.)

3-6-2. Checking if Operations are Normal, and Automatic Adjustment

Perform mechanical adjustments using the service commands. <EXEC> indicates the WRITE command. If the result of checking is OK, the data 00H is set. There is no need to check it again. If the result is NG, the NG command data is stored in the specified address. Check the NG command list.

PAGE4	ADR39H	Received value at E1
PAGE1	ADR18H	Received value at E2
PAGE1	ADR19H	Received value at E3
PAGE1	ADR1AH	Received value at E4
PAGE1	ADR1BH	Received value at E5
PAGE1	ADR26H through 35H	Sensor level
PAGE4	ADR40H through 47H	E1 error history

1. Serial communication check

<Contents> Can communication between boards be performed?
Are the harness and mechanical parts assembled correctly?

<Procedure> (1) Open the platen cover, and pull out the ribbon cartridge and paper tray.
(2) P1 ADR81H <EXEC>
- OK : Bell rings once
- NG : Bell does not ring

<Data check> P1 ADR18H DATA**H

2. Sensor check 1

<Contents> Sensor check 1
Are the harness and mechanical parts assembled correctly?

<Procedure> (1) Open the platen cover, and pull out the ribbon cartridge and paper tray.
(2) P1 ADR82H <EXEC>
- OK : Bell rings once
- NG : Bell rings three times

<Data check> P1 ADR18H DATA**H

3. Thermistor check

<Contents> Is the head set properly?
Are the harness and mechanical parts assembled correctly?

<Procedure> (1) Open the platen cover, and pull out the ribbon cartridge and paper tray.
(2) [P1] [ADR83H] <EXEC>
- OK : Bell rings once
- NG : Bell rings three times

<Data check> [P1] [ADR1AH] [DATA**H]

4. EEPROM check

<Contents> Is IC1 of the SE-417 board operating normally?
Is the relay board connected?
Are the harness and mechanical parts assembled correctly?

<Procedure> (1) Open the platen cover, and pull out the ribbon cartridge and paper tray.
(2) [P1] [ADR84H] <EXEC>
- OK : Bell rings once
- NG : Bell rings three times

<Data check> [P1] [ADR1AH] [DATA**H]

5. THERM & EEPROM check

<Contents> Are the harness and mechanical parts assembled correctly?

<Procedure> (1) Open the platen cover, and pull out the ribbon cartridge and paper tray.
(2) [P1] [ADR85H] <EXEC>
- OK : Bell rings once
- NG : Bell rings three times

<Data check> [P1] [ADR1AH] [DATA**H]

6. Head home check

<Contents> Is the head position sensor operating normally?
Is the head motor operating?
Are the harness and mechanical parts assembled correctly?

<Procedure> (1) Open the platen cover, and pull out the ribbon cartridge and paper tray.
(2) [P1] [ADR86H] <EXEC>
- OK : Bell rings once
- NG : Bell rings three times

<Data check> [P4] [ADR39H] [DATA**H]

7. Tray home check

<Contents> Is the tray position sensor operating normally?
Is the tray motor operating?
Are the harness and mechanical parts assembled correctly?

<Procedure> (1) Open the platen cover, and pull out the ribbon cartridge and paper tray.
(2) [P1] [ADR87H] <EXEC>
- OK : Bell rings once
- NG : Bell rings three times

<Data check> [P4] [ADR39H] [DATA**H]

8. Platen home check

<Contents> Is the platen position sensor operating normally?
Is the platen motor operating?
Are the harness and mechanical parts assembled correctly?

<Procedure> (1) Open the platen cover, and pull out the ribbon cartridge and paper tray.
(2) [P1] [ADR88H] <EXEC>
- OK : Bell rings once
- NG : Bell rings three times

<Data check> [P4] [ADR39H] [DATA**H]

9. FG sensor check

<Contents> Are the paper feed FG sensor, ribbon FG sensor operating normally?
Are the paper feed motor, ribbon motor operating normally?
Are the harness and mechanical parts assembled correctly?

<Procedure> (1) Open the platen cover, and pull out the ribbon cartridge and paper tray.
(2) [P1] [ADR89H] <EXEC>
- OK : Bell rings once
- NG : Bell rings three times

<Data check> [P4] [ADR39H] [DATA**H]

10. Bar code automatic adjustment

<Contents> Automatic adjustment of the light emission level of the bar code sensor, threshold level.
Is the paper feed motor operating?
Are the harness and mechanical parts assembled correctly?

<Procedure> (1) Close the platen cover and insert the ribbon cartridge.
(2) [P1] [ADR8AH] <EXEC>
- OK : Bell rings once
- NG : Bell rings three times

<Data check> [P1] [ADR1BH] [DATA**H]

11. Ribbon code automatic adjustment

<Contents> Light emission levels of the RBN_CD0 sensor, RBN_CD1 sensor.
Automatic adjustment of the threshold level.
Is the ribbon motor operating?
Are the harness and mechanical parts assembled correctly?

<Procedure> (1) Close the platen cover and insert the ribbon cartridge.
(2) [P1] [ADR8BH] <EXEC>
- OK : Bell rings once
- NG : Bell rings three times

<Data check> [P1] [ADR1BH] [DATA**H]

12. Print automatic adjustment

<Contents> Automatic adjustment of light emission level of the PP_JAM sensor, threshold level.
Is printing inconsistent due to the thermal head and gear?
Is the paper pass system normal?
Are the harness and mechanical parts assembled correctly?

<Procedure> (1) Close the platen cover and insert the ribbon cartridge and paper tray.
(2) [P1] [ADR8CH] <EXEC>
- OK : Bell rings once
- NG : Bell rings three times

<Data check> [P4] [ADR39H] [DATA**H]

13. Sensor data

<Contents> Displays the adjustment values (light emission level, high level, low level, threshold level) of the four sensors automatically adjusted. (RBN_CD0 sensor, RBN_CD1 sensor, BARCODE sensor, PP_JAM sensor)

Sensor 0 (ribbon code sensor 0, light emission level value)

[P1] [ADDR4Fh] [DATA00h] <EXEC>

<Data check> [P1] [ADDR26h] [DATA**h]

Sensor 1 (ribbon code sensor 0, high level value)

[P1] [ADDR4Fh] [DATA01h] <EXEC>

<Data check> [P1] [ADDR27h] [DATA**h]

Sensor 2 (ribbon code sensor 0, low level value)

[P1] [ADDR4Fh] [DATA02h] <EXEC>

<Data check> [P1] [ADDR28h] [DATA**h]

Sensor 3 (ribbon code sensor 0, threshold level value)

[P1] [ADDR4Fh] [DATA03h] <EXEC>

<Data check> [P1] [ADDR29h] [DATA**h]

Sensor 4 (ribbon code sensor 1, light emission level value)

[P1] [ADDR4Fh] [DATA04h] <EXEC>

<Data check> [P1] [ADDR2Ah] [DATA**h]

Sensor 5 (ribbon code sensor 1, high level value)

[P1] [ADDR4Fh] [DATA05h] <EXEC>

<Data check> [P1] [ADDR2Bh] [DATA**h]

Sensor 6 (ribbon code sensor 1, low level value)

[P1] [ADDR4Fh] [DATA06h] <EXEC>

<Data check> [P1] [ADDR2Ch] [DATA**h]

Sensor 7 (ribbon code sensor 1, threshold level value)

[P1] [ADDR4Fh] [DATA07h] <EXEC>

<Data check> [P1] [ADDR2Dh] [DATA**h]

Sensor 8 (bar code sensor, light emission level value)

[P1] [ADDR4Fh] [DATA08h] <EXEC>

<Data check> [P1] [ADDR2Eh] [DATA**h]

Sensor 9 (bar code sensor, high level value)

[P1] [ADDR4Fh] [DATA09h] <EXEC>

<Data check> [P1] [ADDR2Fh] [DATA**h]

Sensor A (bar code sensor, low level value)

P1 ADDR4Fh DATA0Ah <EXEC>

<Data check> P1 ADDR30h DATA**h

Sensor B (bar code sensor, threshold level value)

P1 ADDR4Fh DATA0Bh <EXEC>

<Data check> P1 ADDR31h DATA**h

Sensor C (paper jamming sensor, light emission level value)

P1 ADDR4Fh DATA0Ch <EXEC>

<Data check> P1 ADDR32h DATA**h

Sensor D (paper jamming sensor, high level value)

P1 ADDR4Fh DATA0Dh <EXEC>

<Data check> P1 ADDR33h DATA**h

Sensor E (paper jamming sensor, low level value)

P1 ADDR4Fh DATA0Eh <EXEC>

<Data check> P1 ADDR34h DATA**h

Sensor F (paper jamming sensor, threshold level value)

P1 ADDR4Fh DATA0Fh <EXEC>

<Data check> P1 ADDR35h DATA**h

[Display] (Example) 84 f5 0f 80

(One-byte data is displayed using a HEX code. In each sensor, data is arranged in the order of "light-emitting level value", "high-level value", "low-level value", and "threshold value" from the top. For the data described above, the LED voltage value is 84, and the high value of PHTR is f5. The low value of PHTR is 0f, and the threshold value is 80.)

[How to convert the data displayed using a HEX code into a sensor voltage value]

- The displayed data indicates the value obtained when the voltage levels (0 through 5V) of each sensor are equally divided into 1/256. Therefore, the voltage value that the HEX code indicates can be obtained from the calculation below.

  (Example) When the HEX code is h 'b3 h 'b3 = d' 179 (← Converts the hexadecimal display into a decimal display.)
  5.0(V) x 179 / 256 = 3.4(V)(← Voltage value of sensor indicated by h 'b3)

14. Error History Information

<Contents> Mechanical deck error history information.
Reads information on errors which occurred during mechanical operations.
The latest 8 errors are preserved.
The contents correspond to the NG_CODE1 data.

<Procedure> P1 ADR5FH <EXEC>

<Data check> P4 ADR40H DATA**H Data 0=Latest error information
P4 ADR41H DATA**H Data 1
P4 ADR42H DATA**H Data 2
P4 ADR43H DATA**H Data 3
P4 ADR44H DATA**H Data 4
P4 ADR45H DATA**H Data 5
P4 ADR46H DATA**H Data 6
P4 ADR47H DATA**H Data 7

NG command list 1

A way of looking the list: Refer to the displayed NG data.

In case h ' 19 , It becomes HEAD FF2 FF1 TIMEOUT.

NG_CODE1

NG command	NG data	contents of NG	Board/REF	Check item
h' E1	h' 11	HEAD HOME TIMEOUT	SE-420 board/PH201	• Connector is removed.
	h' 12	HEAD PRN FF2 TIMEOUT	SE-420 board/PH202	• Motor / sensor are defective.
	h' 13		SU-36 board	• There is no sensor sensitive by mistaken assembling the mechanism.
	h' 14	HEAD TRAY TIMEOUT		
	h' 15	HEAD FF PRN TIMEOUT		
	h' 16	HEAD HOME FF1 TIMEOUT		
	h' 17	HEAD HOME FF2 TIMEOUT		
	h' 18	HEAD FF HOME TIMEOUT		
	h' 19	HEAD FF2 FF1 TIMEOUT		
	h' 1a			
	h' 1b	HEAD FF1 TIMEOUT		
	h' 21	TRAY HOME LOAD TIMEOUT1	SE-429 board/PH601	• Connector is removed.
	h' 22	TRAY HOME LOAD TIMEOUT2	SE-429 board/PH602	• Motor / sensor are defective.
	h' 23	TRAY HOME OUT TIMEOUT	SU-38 board	• There is no sensor sensitive by mistaken assembling the mechanism.
	h' 24	TRAY OUT HOME TIMEOUT		
	h' 25	TRAY LOAD HOME TIMEOUT		
	h' 26	TRAY LOAD HOME TIMEOUT		
	h' 2a	TRAY PAPER OUT TIMEOUT		
	h' 2b	TRAY PAPER IN TIMEOUT		
	h' 33	RIBBON Y TIMEOUT	SE-423 board/D301, D302	• Connector is removed.
	h' 34	RIBBON MCL TIMEOUT	SE-424 board/Q350, Q351	• Motor / sensor are defective.
				• There is no sensor sensitive by mistaken assembling the mechanism.
	h' 38	BARCODE START ERROR	SE-425 board/PH401	• Connector is removed.
	h' 39	BARCODE BIT ERROR		• Motor / sensor are defective.
				• There is no sensor sensitive by mistaken assembling the mechanism.
	h' 41	PLT HOME TIMEOUT	SE-419 board/PH150	• Connector is removed.
	h' 42	OLT HOME ERROR	PLT_MTR	• Motor / sensor are defective.
				• There is no sensor sensitive by mistaken assembling the mechanism.
	h' 51	LOAD TMG TIMEOUT	SE-427 board/PH501	• Connector is removed.
	h' 52	LOAD TNG FGOUT	SU-39 board	• Motor / sensor are defective.
	h' 53	LOAD PAPER TIMEOUT1		• There is no sensor sensitive by mistaken assembling the mechanism.
	h' 54	LOAD PAPER TIMEOUT2		
	h' 58	EJECT TMG TIMEOUT	SE-428 board/PH550	• Connector is removed. / Part is defective.
				• There is no sensor sensitive by mistaken assembling the mechanism.
	h' 61	CHUCK ERROR	SE-422 board/PH250	• Connector is removed. / Part is defective.
	h' 62	PP JAM ERROR		• There is no sensor sensitive by mistaken assembling the mechanism.

NG command list 2

A way of looking the list: In case h ' 0A = 0000 1010(Refer to HEX code converting as binary code.)

NG sensor is first bit(PLT CV) and third bit(PP SIZE sensor)

NG _CODE2

NG command	NG bit	Contents of NG	Board/REF	Check item
h' E2	bit 6	LOAD_TMG sensor	SE-427 board/PH501	• Connector is removed. • Part is defective. • The sensor becomes ON by mistaken assembling the mechanism.
	bit 5	EJCT_TMG sensor	SE-428 board/PH550	
	bit 4	RBN_CST sensor	Push SW	
	bit 3	PP_SIZE sensor	SE-426 board/PH450	
	bit 2	PAPER sensor	SE-426 board/PH451	
	bit 1	PLT_CV sensor	SE-419 board/S150	
	bit 0	KICK_OUT sensor	SE-430 board	

NG_CODE3

NG command	NG bit	Contents of NG	Board/REF	Check item
h' E4	bit 6	Head thermistor	Thermal head	• Connector is removed. • Thermal head
	bit 5	Head thermistor		
	bit 4	Room thermistor	PRT-11 board TH1	• Part is defective.
	bit 3	Room thermistor		
	bit 2			
	bit 1	EEPROM ERROR	SE-417 board/IC1	• Connector is removed. • Part is defective.
	bit 0	EEPROM ERROR		

NG command list 3

A way of looking the list: In case h ' 24 = 0010 0100(Refer to HEX code converting as binary code.)

NG sensor becomes second bit(LOAD FG) and fifth bit(RIBBON CD0).

NG_CODE4

NG command	NG bit	Contents of NG	Board/REF	Check item
h' E5	bit 6	RIBBON_CD1_ERROR	SE-423 board/D302 SE-424 board/Q351	• Connector is removed./ Part is defective. • Optical axis is out of place.
	bit 5	RIBBON_CD0_ERROR	SE-423 board/D301 SE-424 board/Q350	• Connector is removed./ Part is defective. • Optical axis is out of place.
	bit 4	BARCODE_ERROR	SE-425 board/PH401	• Connector is removed./ Part is defective. • Optical axis is out of lace.
	bit 3	PP_JAM_ERROR	SE-422 board/PH250	• Connector is removed./ Part is defective.
	bit 2	LOAD_FG_ERROR	SE-418 board/PH101	• Connector is removed./ Part is defective.
	bit 1	RIBBON_FG_ERROR	SE-417 board/PH1	• Connector is removed./ Part is defective.
	bit 0			

A way of looking the list: In case h ' 42 = 0100 0010(Refer to HEX code converting as binary code.)

NG sensor becomes first bit(LOAD TMG sensor) and sixth bit(JAM sensor).

NG_CODE5

NG command	NG bit	Contents of NG	Board/REF	Check item
h' E0	bit 6	PP_JAM_ERROR	SE-422 board/PH250	There is a print paper in the mechanical deck.
	bit 5	END_OF_RIBBON	SE-423 board/D301, D302 SE-424 board/Q350, Q351	Ribbon end
	bit 4	NO_RIBBON	Push SW	There is no ribbon cartridge.
	bit 3	NO_PAPER	SE-426 board/PH451	There is no print paper.
	bit 2	REMOVE_PRINTS	SE-428 board/PH550	EJCT_TMG sensor becomes ON.
	bit 1	REMOVE_PRINTS	SE-427 board/PH501	LOAD_TMG sensor becomes ON.
	bit 0	CLOSE_COVER	SE-429 board/S150	PLATEN_COVER is opened.

NG_CODE6

NG command	NG bit	Contents of NG	Board/REF	Check item
h' E3	bit 6	PLT_POS	SE-419 board/PH150	• Connector is removed. • Part is defective. • There is no sensor sensitive by mistaken assembling the mechanism.
	bit 5	LOAD_FG	SE-418 board/PH1	
	bit 4	RBN_FG	SE-417 board/PH1	
	bit 3	TRAY_POS1	SE-429 board/PH602	
	bit 2	TRAY_POS0	SE-429 board/PH601	
	bit 1	HED_POS1	SE-420 board/PH202	
	bit 0	HED_POS0	SE-420 board/PH201	

SECTION 4
CIRCUIT DESCRIPTION

4-1. CIRCUIT OPERATIONS OF IF-687 BOARD

[Outline]

Main Functions of IF-687 Board

(1) Receives command data from the personal computer via the parallel interface.
(2) Sends command data to the personal computer via the parallel interface.
(3) Receives bit map image data from the personal computer via the parallel interface and writes in the DRAM.
(4) Reads data from the DRAM during printing, and sends it to the PRT-11 board via the masking table (in the case of UP-D2550 (For J)).
(5) Determines key inputs, LED lighting

Structure of IF-687 Board

(1) IEEE-1284 (Interactive parallel=Bi-Centronics) interface circuit
(2) DRAM and control circuit
(3) CPU
(4) Color adjustment, masking table

[UP-D2500 (For UC and CE) and UP-D2550 (For J)]

The UP-D2500 (For UC and CE) and UP-D2550 (For J) differ in the capacity of the image memory mounted.

UP-D2500 (For UC and CE) 2 MB (IC107 only) For the screen of 1 color
UP-D2550 (For J) 4 MB (IC107, IC108) For the screen of 3 colors

With the UP-D2500 (For UC and CE), images are transferred before printing starts for Y, M, and C in the printing operations of the printer driver.

Printing starts→Y transfer→Y printing→M transfer→M printing→C transfer→C printing→End

As masking is performed by the host computer, the printer is not equipped with the masking ROMs IC105 and IC106.
During 155 dpi mode printing and 4-division and 16-division printing, masking is performed by the host computer, and printing starts after all the data has been accumulated in the printer.
The UP-D2550 (For J) starts printing after accumulating all the data in the memory for the screen of 3 colors.

Printing starts→RGB transfer→Y printing→M printing→C printing-End

RGB-YMC conversion and masking are performed by the printer.

[IEEE-1284 Interface]

The UP-D2500/2550 adopts an IEEE-1284.
The IEEE-1284 is an expanded version of the Centronics interface used by current printer ports, and offers such merits as interactive communication and fast transfer speed (ECP mode). The UP-D2500/2550 is compatible with the following operations modes of the IEEE-1284.

Compatible mode (Host→Printer)

The communication protocol is the same as the current Centronics interface.

Nibble mode (Printer→Host)

Mode which performed reverse direction communication using the control lines in the Compatible mode-PE, BUSY, FAULT, and SELECT

ECP mode (Host↔Printer)

Interactive communication mode with fast transfer speed

Interactive communication is performed by using Compatible and Nibble as a pair.
Switching between Compatible-Nibble and ECP is performed by setting the BIOS of the personal computer.
Windows 95 supports all of the above modes-Compatible, Nibble, and ECP.
The details of the control commands are exclusive to the UP-D2500/2550 and not disclosed.

[Generation Circuit]

20 MHz clocks are generated by IC202 and the ceramic oscillator X201.
All the circuits on the IF-687 board operate according to this clock. The clock is input to the system controller CPU IC204, memory controller gate array IC102, and interface controller IC209, and becomes their operation clock.

[Reset Circuit]

IC203 is a voltage detection IC. The +5V power supply voltage is inputted to Pin 2 via R228, C209, and C210.
A signal maintained at the low level for about 40 msec after the power is started is output from Pin 1 and used as the reset signal of the system controller IC204, PRT-11 board, and peripheral ICs.

[IEEE-1284 (Interactive Parallel=Bi-Centronics) Interface Circuit]

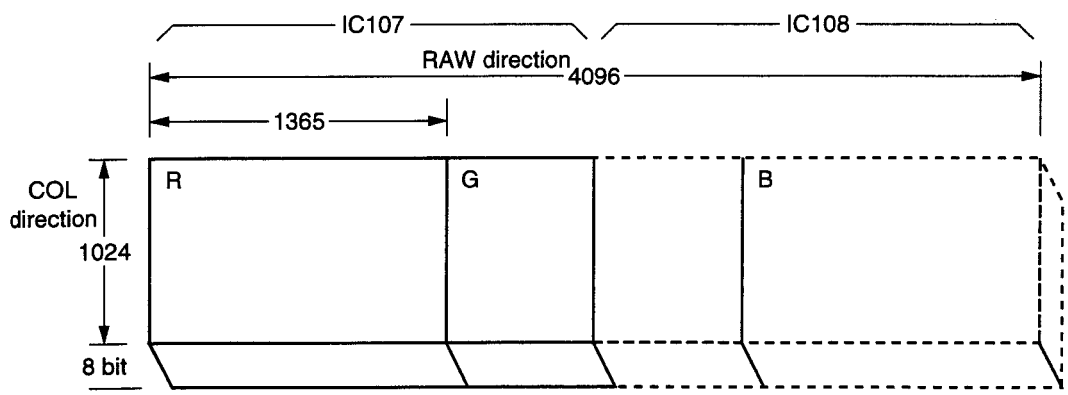
IC209 controls the operation modes of the IEEE-1284 interface. It performs such operations as shifting to the mode required for communication according to the setting of the register from the system controller IC204 and data transmission/reception.
IC205 and IC206 is a interactive driver IC which conforms to the IEEE-1284 standards, while IC207 is the buffer IC of the control line.
The data input from the host computer via CN201 is inputted to IC209 via the IC205 through IC207 buffer. IC209 sets the interrupt signal (Pins 1 through 3, the role differs according to the mode) to active for every 1 byte of data, and notifies the system controller IC204 if the data is the command data, and notifies the memory controller IC102 if the data is the image data. Upon receiving this interrupt signal, IC204 and IC102 read the data using the RD signal. IC204 also writes the data in IC209 based on the earlier mentioned interrupt signal even when sending the data from the printer to the host computer. (The UP-D2500/2550 performs only command data communication in reverse direction communication.)

[DRAM and Control Circuit]

IC102 is a memory control gate array developed for the UP-D2500/2550. Its main functions are as follows.

(1) Divides the data bus inputted from IC209 to the command data bus and image data bus according to the setting from the system controller IC204. If the data is the command data, it sends the data to the IC204 as it is. (Data is sent to the image data bus side while the control line DMAEN (Pin 111) from IC204 is received and DMABSY (Pin 115) is active).
(2) Writes the image data in the DRAM IC107 and IC108 one byte at a time by the external synchronization when it receives the interrupt (Pins 152 through 154) from IC209. (DMA transfer)
(3) During printing, reads the data one byte at a time from the DRAM IC107 and IC108 by the internal synchronization, organizes the data to 3 bytes for R, G, and B, and sends the data to the color adjustment IC. (Pins 51 through 58, 61 through 68, 71 through 78.)
(4) Writes the test pattern set for the register in the DRAM by the internal synchronization.
(5) Performs DRAM refresh operations (RAS only refresh) by the cycle set by the register

Image data is stored on the DRAM as follows.



* With the UP-D2500 (For UC and CE), the R side area is used as the image memory in the normal print mode.
* The UP-D2500 (For UC and CE) mounts only IC107 while the UP-D2550 (For J) mounts both IC107 and IC178.

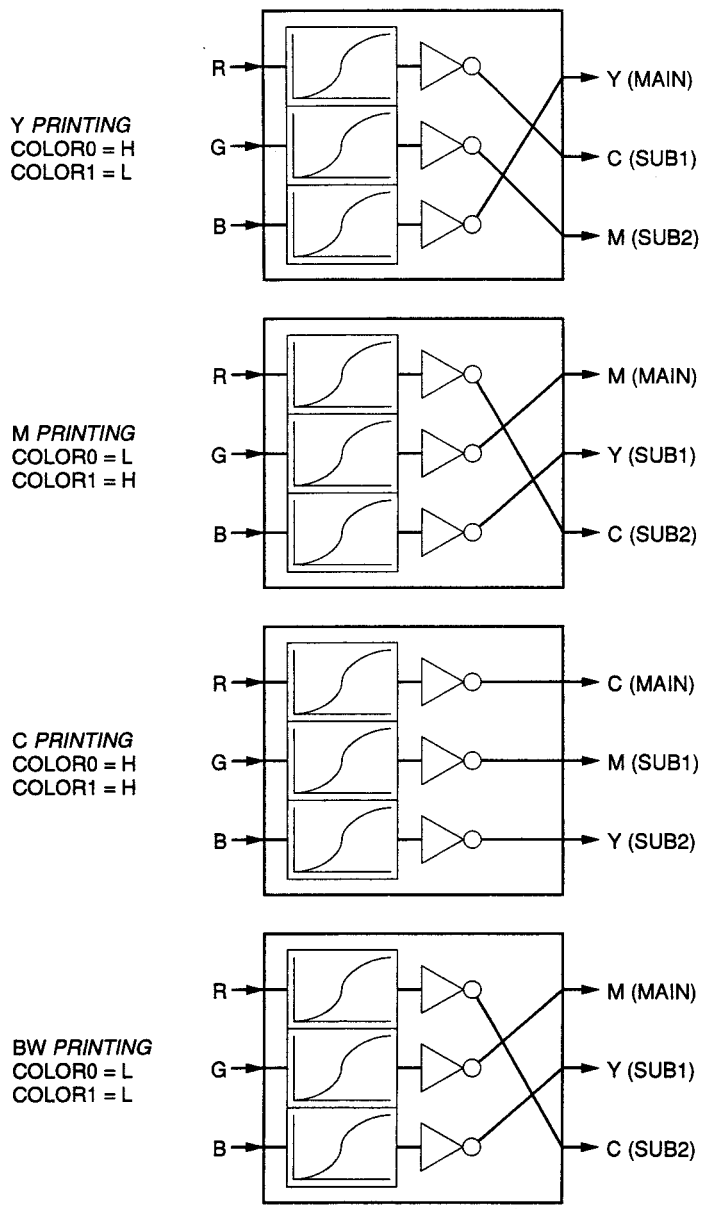
[CPU]

IC204 is a system controller CPU and its main functions are as follows.
(1) Communication with the host computer
(2) Serial-communication (Pins 77 through 80) with the mechanical control CPU (PRT-11 board)
(3) Sets data in the memory control gate array (IC102)
(4) Sets data in the color palette IC101
(5) Serial-communication with the EEPROM (IC201)
(6) Lights up LEDs
Print, Alarm, Ribbon, Paper
(7) Determines key inputs
Print (UP-D2550 (For J) only), Stop
(8) Sounds the buzzer
(9) Selects the marking (UP-D2550 (For J) only)

The program is memorized in the external ROM IC210.
CNI212 is a socket for tools. It is used for inserting the LED display for showing data during adjustments.
S201 through S207 are also keys for adjustments.

[Color Adjustment, Masking Table]

IC101 is a color adjustment IC.
During the printing of Y, M, and C, it performs color rotation, RGB-YMC conversion of the printed data.
It also performs color adjustment using the look-up table memory.
The table data is memorized by the CPU program ROM. (UP-D2550 (For J) only) The following shows the data flow.



IC105 and IC106 are two ROM data conversion type masking ROMs. They correct deviation in the ideal color reproduction and color of the print. (UP-D2550 (For J) only)
In the case of the UP-D2500 (For UC and CE), the data output from the color adjustment IC101 is sent directly to the PRT-11 board (CN102) without going through IC105 and IC106.

4-2. PRINT CONTROL SECTION (PRT-11 BOARD)

Outline

PRT-11 board is consisted of mechanism control block and head control block.

The mechanism control block is composed following circuits.

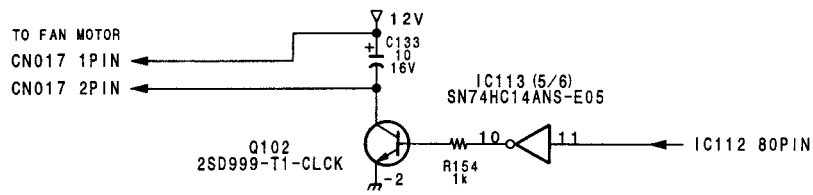
Fan motor drive circuit
Ribbon motor drive circuit
Paper supply motor drive circuit
Head motor drive circuit
Tray motor drive circuit
Platen motor drive circuit
Various kinds sensor detection circuit
(Paper ejection motor drive circuit)

The head control block is composed following sections.

γ correction ROM(IC206)
PQC IC(IC207)
Head control IC(IC208)
Number lines correction IC(IC210)

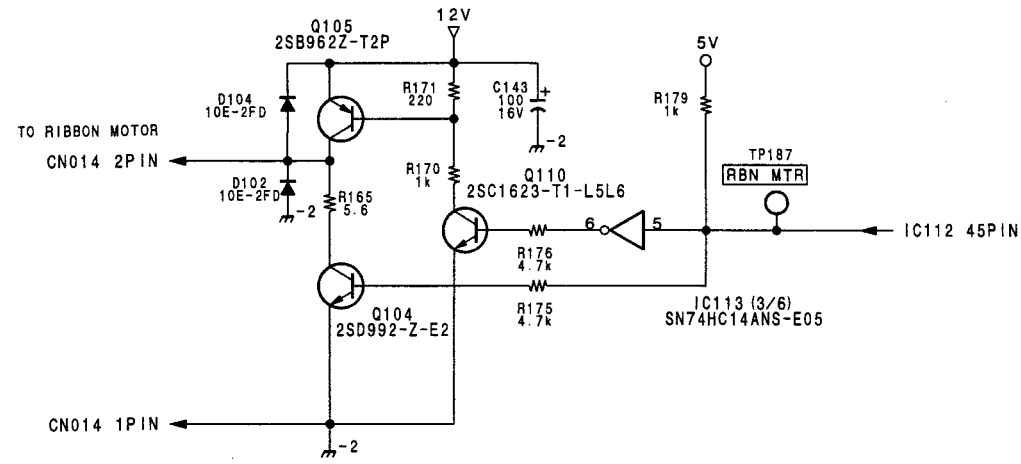
4-2-1. Fan motor drive circuit

Fan motor is driven by the control signal from pin 80 of IC112(CPU). When the temperature of thermal head is higher than the certain value in the printing or stand-by mode, this signal is set to the "LOW", the fan motor is rotated.



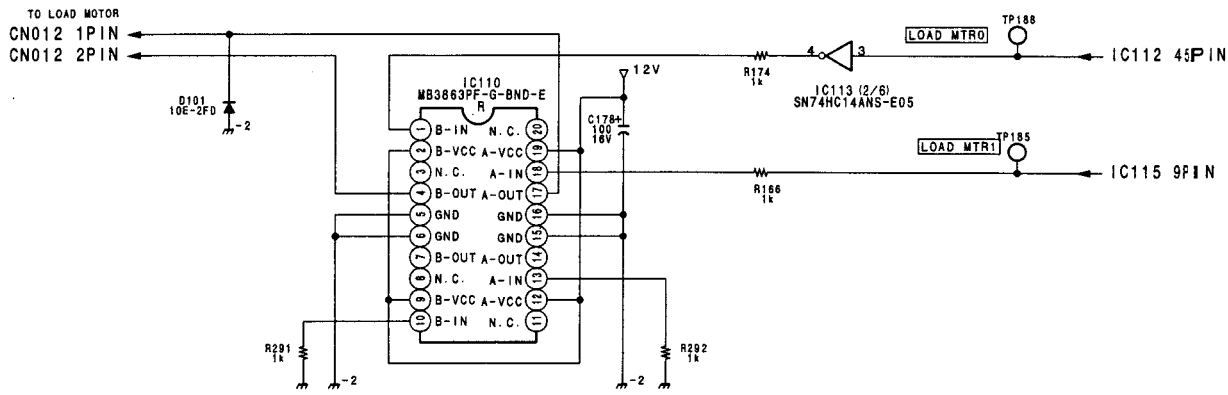
4-2-2. Ribbon motor drive circuit

The ribbon motor is driven with PWM by the control signal (active L) from the pin 45 of IC112.



4-2-3. Paper supply motor drive circuit

The paper supply motor is driven with PWM by (active L) from pin 46 of IC112(CPU) and pin 9 of IC115 (parallel port).



4-2-4. Head motor and tray motor drive circuit

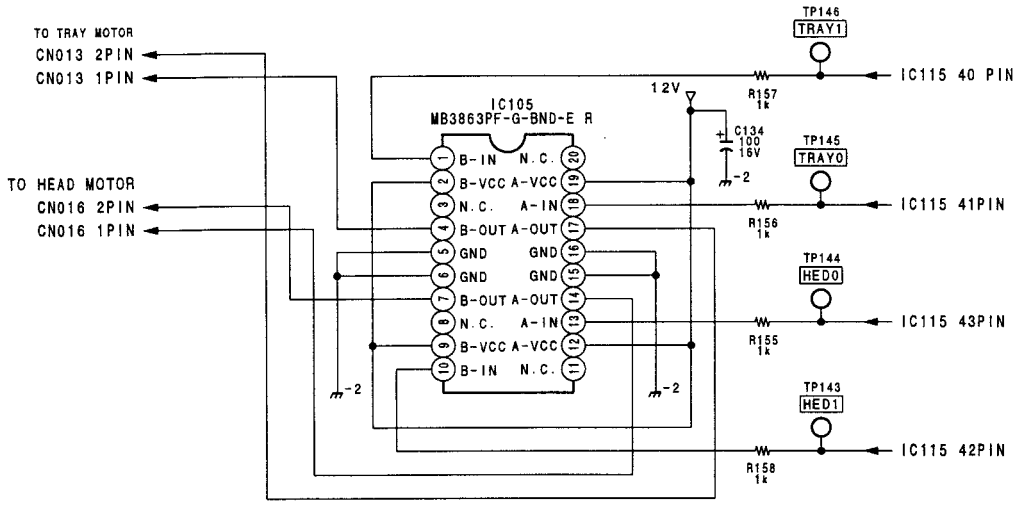
The control signal from } pins 42 and 43 of IC115(parallel port) head motor
pins 40 and 41 of IC115(parallel port) tray motor

is entered to } the pins 10 and 13 of IC105 head motor .
pins 1 and 18 of IC105 tray motor .

The motor is driven by the voltage from } pins 7 and 14 head motor .
pins 4 and 17 tray motor .

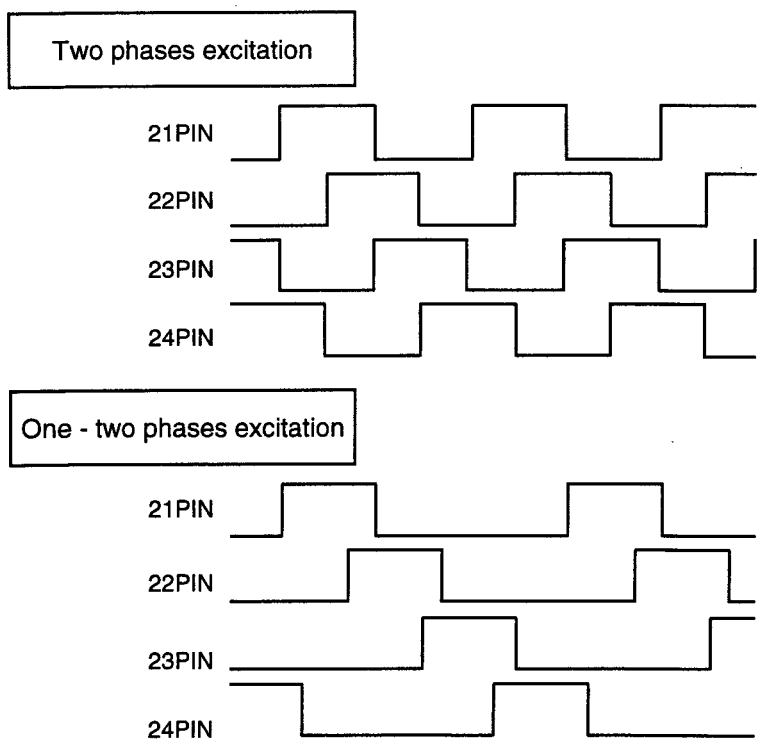
The up and down brakes are performed with following assemblies.

	Pins 40 and 42 of IC115	Pins 41 and 43 of IC115
Up	H	L
Down	L	H
Brakes	H	H
Others	L	L



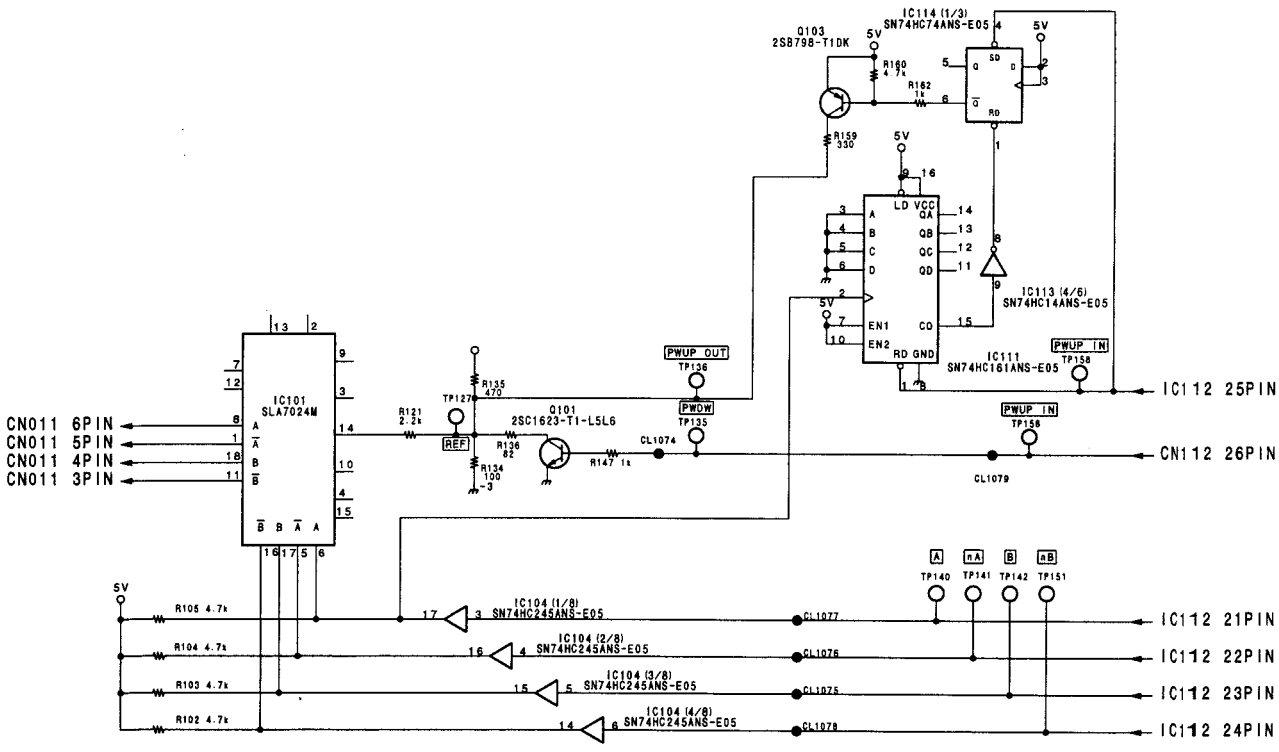
4-2-5. Platen motor drive circuit

The platen is driven by stepping motor via the belt. There are two stepping motor excitation system, two phases and one- two phases. Each phase(A, A, B, B) control signal is outputted from pins 21 through 24 of IC112(CPU). The control signal is inputted to the pins 6, 5, 17 and 16 of IC101 as active L via the buffer IC104. The stepping motor is driven by chopper driving.



The output current value of IC101 is changed by control signal of pins 25 and 26 of IC112(CPU) and the torque of the stepping motor is changed.

	pin 25 of IC112	pin 26 of IC112	output current value
normal	H	L	530 mA
power up	L	L	840 mA
power down	H	H	270 mA



4-2-6. Various kinds sensor detection circuit

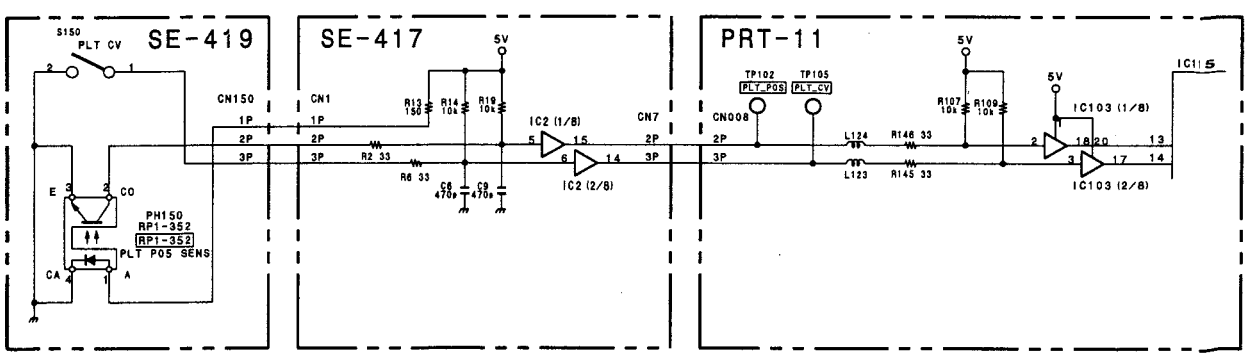
Platen position sensor	Paper sensor
Platen cover sensor	Paper supply timing sensor
Head position sensor	Eject paper timing sensor
Ribbon cassette sensor	Tray position sensor
Paper jamming sensor	Paper ejector sensor
Ribbon code sensor	Ribbon FG sensor
Bar code sensor	Paper supply FG sensor
Paper size sensor	

The following sensors are performed A/D conversion.

Ribbon code sensor
Paper jamming sensor
Bar code sensor

These threshold levels are successively changed. The threshold level is fetched from E^2PROM when the power is turned ON. After print is ended and the bar code is read, suitable setting value is calculated and is written in the E^2PROM.
(The level can be ensured in the mechanical tool mode.)

1) Platen position sensor
   Route : SE-419 to SE-417 to PRT-11
   TP : PRT-11 board TP102
   Function : Home position distinction of platen
   Level : H Home position
   L Except home position
2) Platen cover sensor
   Route : SE-419 to SE-417 to PRT-11
   TP : PRT-11 board TP105
   Function : Distinction whether platen cover is opened or not
   Level : H Cover is opened.
   L Cover is closed.



3) Head position sensor

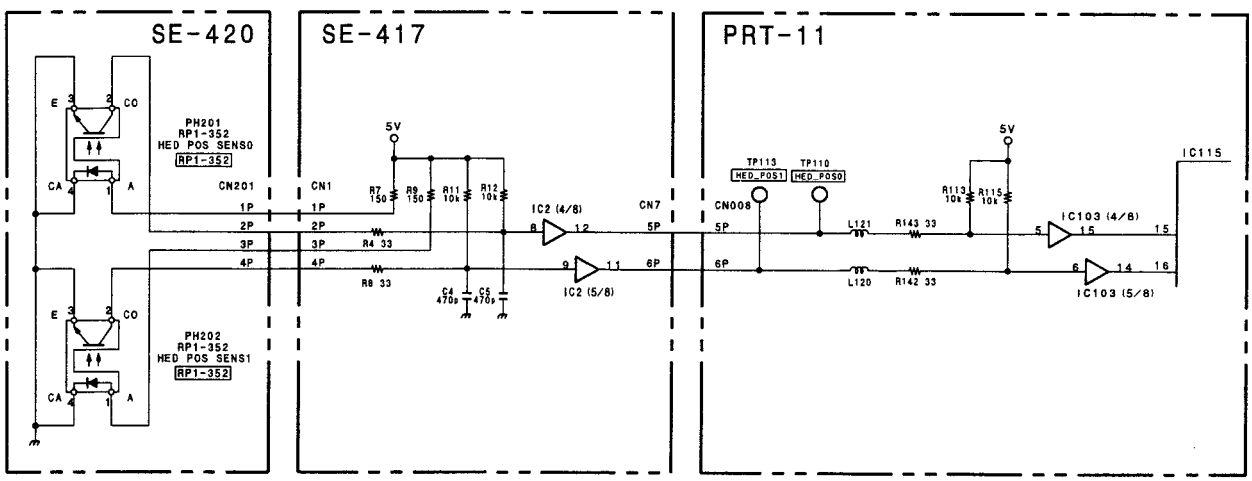
Route : SE-420 to SE-417 to PRT-11

TP : PRT-11 board TP110(HED_POS 0),TP113(HED_POS 1)

Function : Distinction of thermal head position

Level :

	HED_POS 0	HED_POS 1
Indefinite	H	H
FF1 position	H → L	H
FF2 position	L → H	H
Print position	H	L
Home position	L	L



4) Ribbon cassette sensor

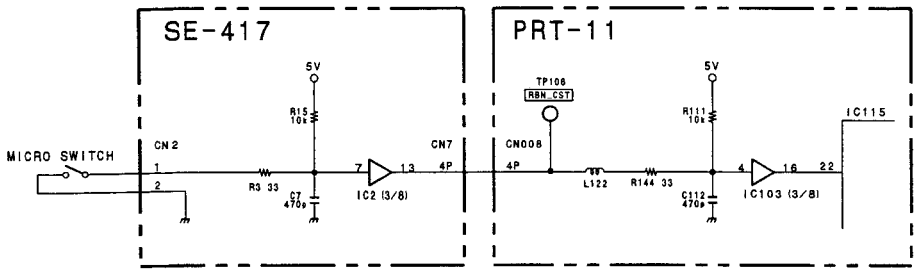
Route : Microswitch to SE-417 to PRT-11

TP : PRT-11 board TP108

Function : Distinction whether the ribbon cassette is inserted into the unit or not.

Level : H The ribbon cassette is not inserted.

: L The ribbon cassette is inserted.



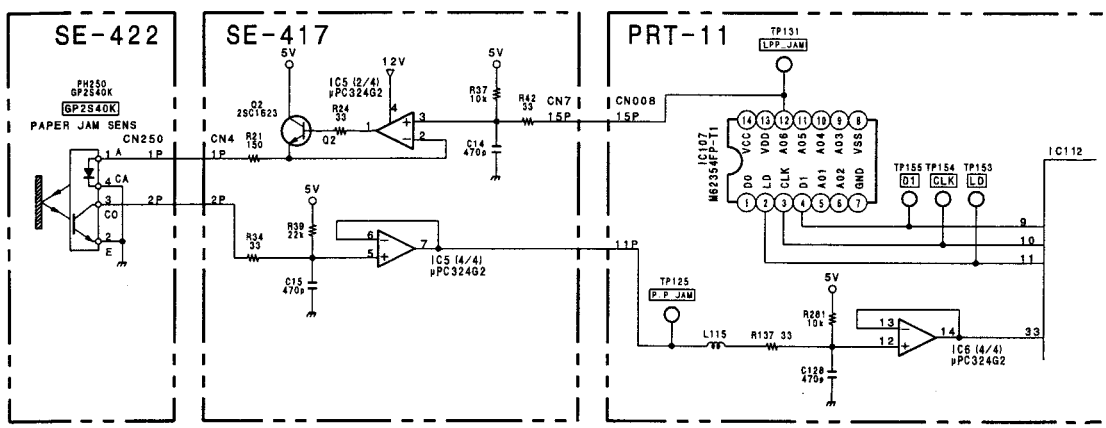
5) Paper jamming sensor

Route : SE-422 to SE-417 to PRT-11

TP : PRT-11 board TP125

Function : Distinction whether the print paper is correctly supplied or not.
Distinction whether the print paper remains into the mechanism during stand-by mode or not.

Level : H There is not the print paper into the mechanism.
: L There is the print paper into the mechanism.



6) Ribbon code sensor (LED)

Route : SE-423 to SE-425 to SE-417 to PRT-11

TP : PRT-11 board TP128(LRBN_CD 0),TP129(LRBN_CD 1)

Function : Luminescence LED of start, end and beginning code detection marks of ribbon distinction sensor.

7) Ribbon code sensor(PHTR)

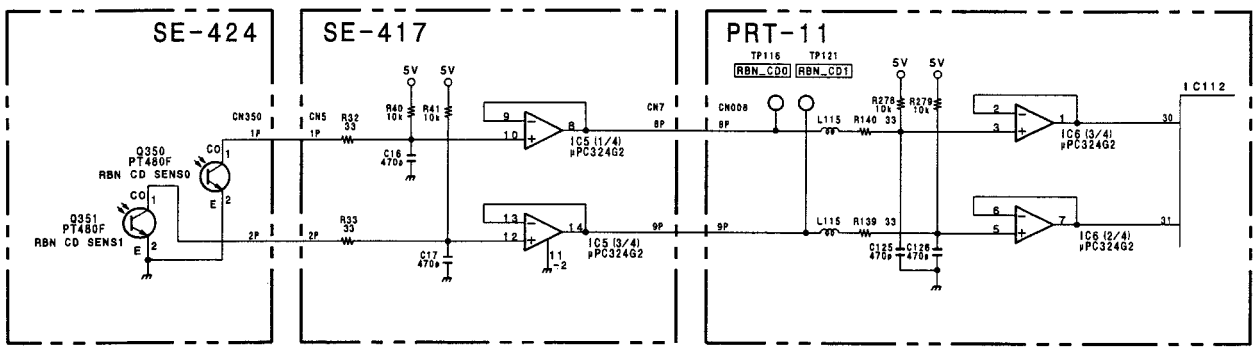
Route : SE-424 to SE-417 to PRT-11

TP : PRT-11 board TP118(RBN_CD 0),TP121(RBN_CD 1)

Function : Distinction of start, end and beginning code detection marks of ribbon. (Photo transistor)

Level :

	RBN_CD 0	RBN_CD 1
Ribbon end	H	H
Beginning detection of YELLOW	L	H
Beginning detection of MAGENTA and CYAN	H	L
Others	L	L



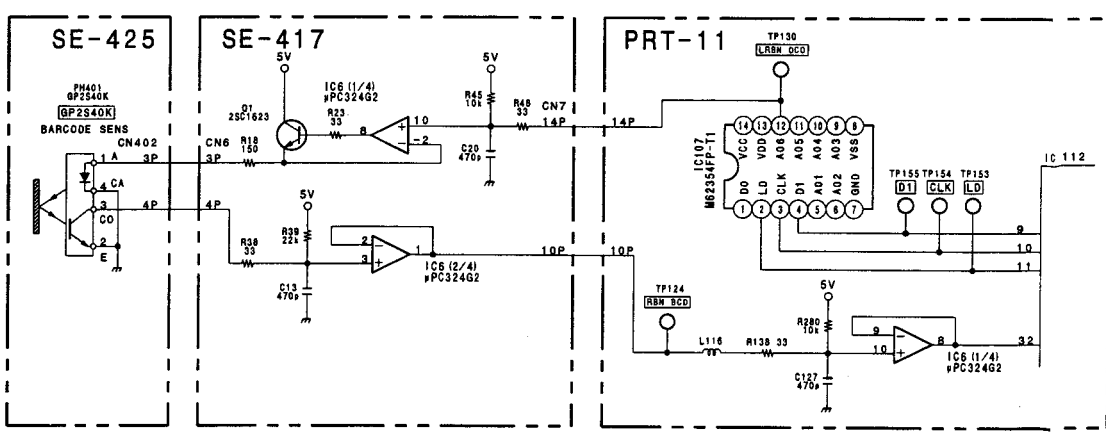
8) Bar code sensor

Route : SE-425 to SE-417 to PRT-11

TP : PRT-11 board TP124

Function : Detection of bar code ring that is distinguished the kind of ribbons.

Level : Rectangle waveform output



9) Paper size sensor

Route : SE-426 to SE-418 to PRT-11

TP : PRT-11 board TP115

Function : Distinction whether paper set is print paper or post card or not.

Level : H Post card, paper for laminate

L Standard, paper for sticker

10) Paper sensor

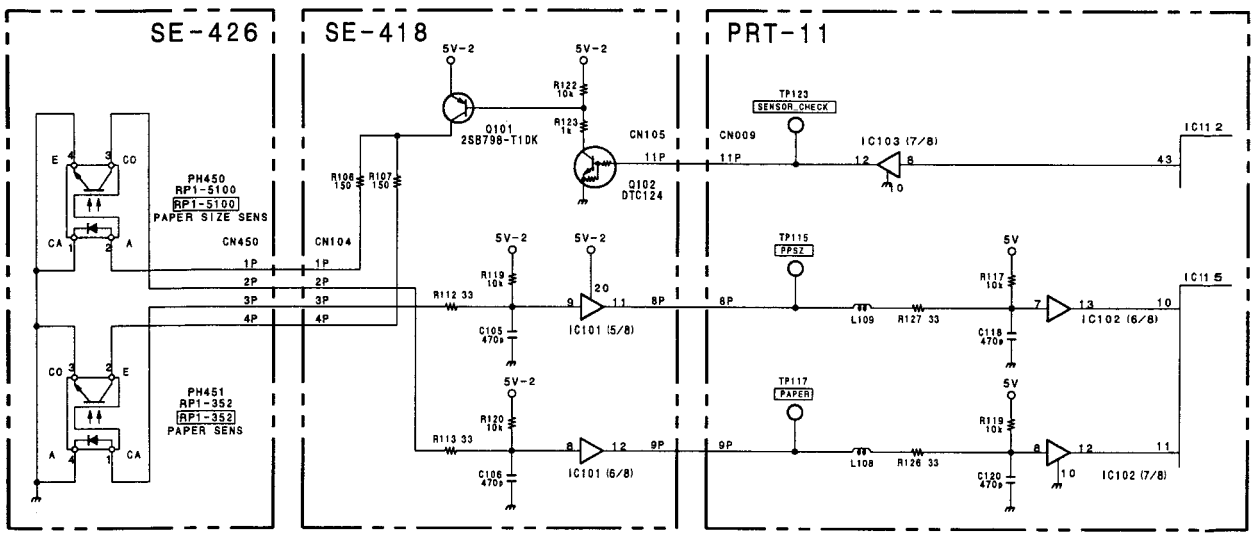
Route : SE-426 to SE-418 to PRT-11

TP : PRT-11 board TP117

Function : Distinction whether paper supply tray or the print paper is set or not.

Level : H The print paper is set, or the paper supply tray is set and there is not print paper.

L There is not print paper, the paper supply tray is not set.



11) Paper supply timing sensor

Route : SE-427 to SE-418 to PRT-11

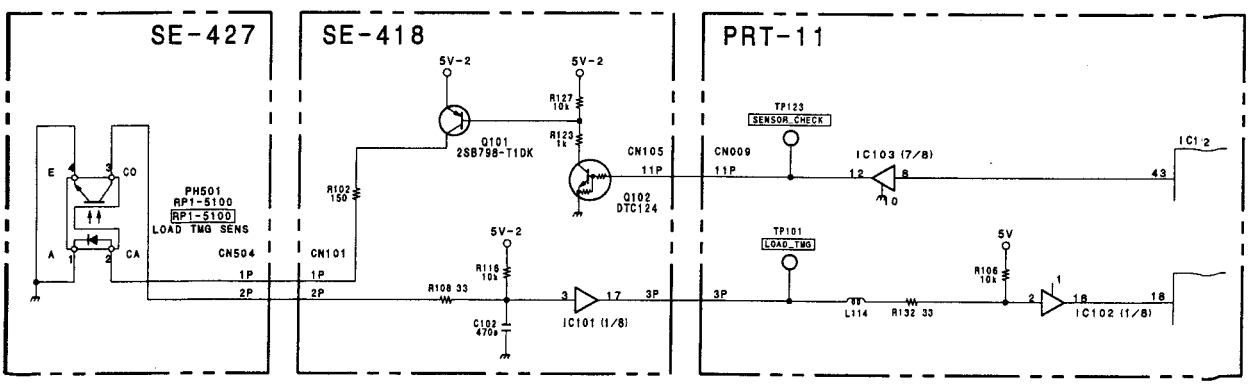
TP : PRT-11 board TP101

Function : Distinction whether print paper is correctly supplied or not.

Distinction whether print paper is jammed at paper supply entrance during the stand-by mode.

Level : H There is a print paper at paper supply entrance.

L There is not print paper at paper supply entrance.



12)Eject paper timing sensor

Route : SE-428 to SE-418 to PRT-11

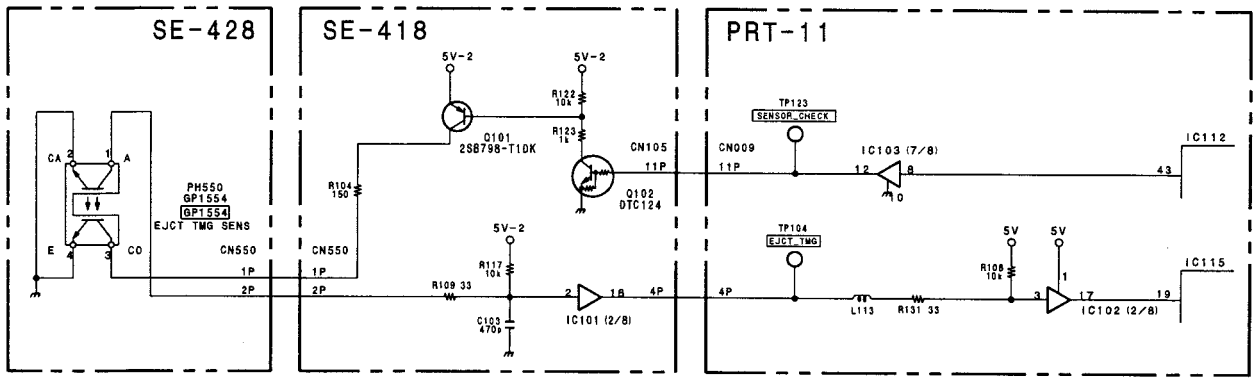
TP : PRT-11 board TP104

Function : Mechanical timing distinction of during eject paper operation

Distinction whether the print paper is jammed at eject paper exit or not.

Level : H There is a print paper at delivery paper exit.

L There is not print paper at delivery paper exit.



13)Tray position sensor

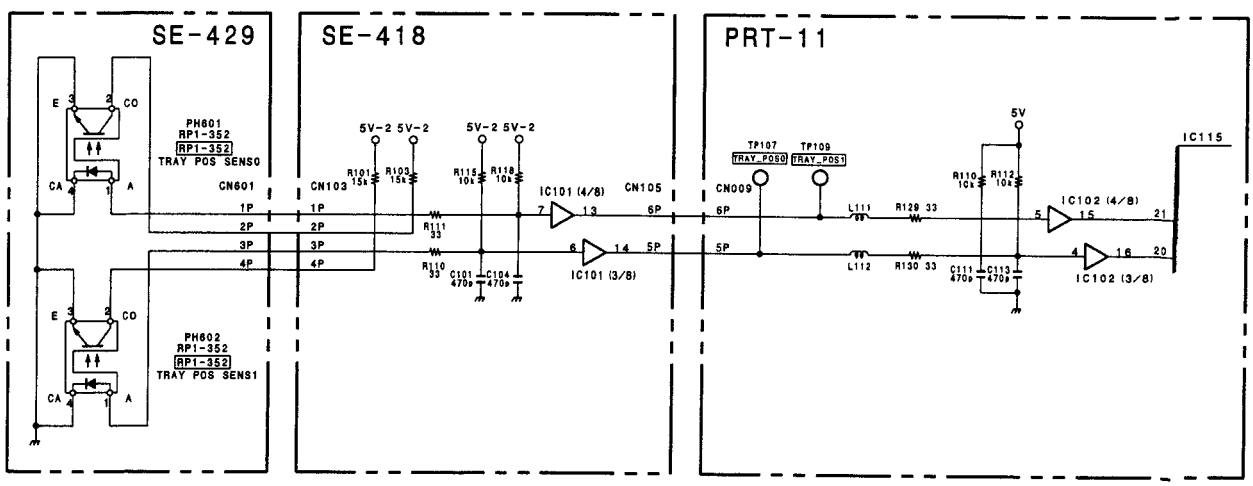
Route : SE-429 to SE-418 to PRT-11

TP : PRT-11 board TP107(TRAY_POS 0),TP109(TRAY_POS 1)

Function : Distinction of paper supply arm and eject paper arm positions

Level :

	TRAY_POS 0	TRAY_POS 1
Others	H	H
Paper supply position	L	H
Eject paper position	H	L
Home position	L	L



14) Paper ejector sensor

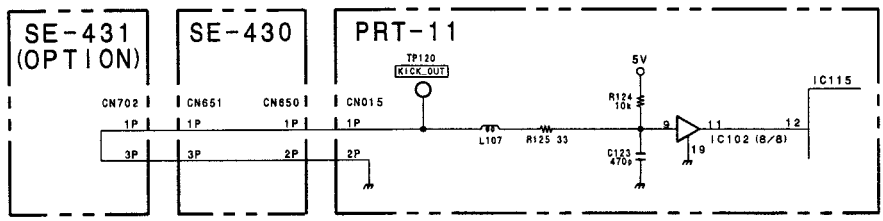
Route : PRT-11

TP : PRT-11 board TP120

Function : Distinction whether the paper ejector(option) is inserted or not.

Level : H The paper ejector is not set.

L The paper ejector is set.



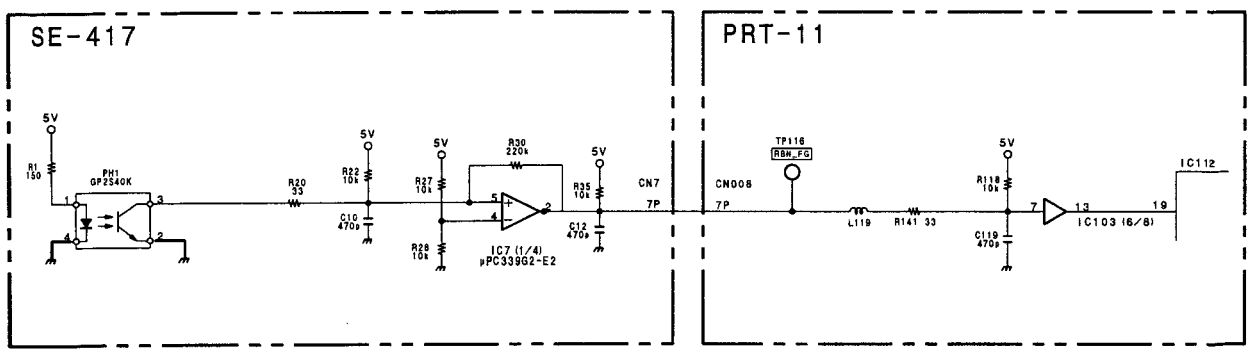
15) Ribbon FG sensor

Route : SE-417 to PRT-11

TP : PRT-11 board TP116

Function : Rotation number of ribbon take-up side is detected.

Level : Rectangle waveform output



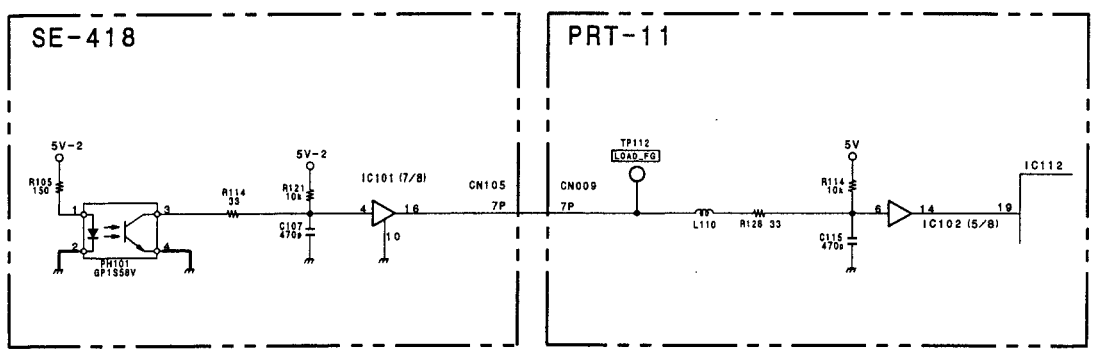
16) Loading paper FG sensor

Route : SE-418 to PRT-11

TP : PRT-11 board TP112

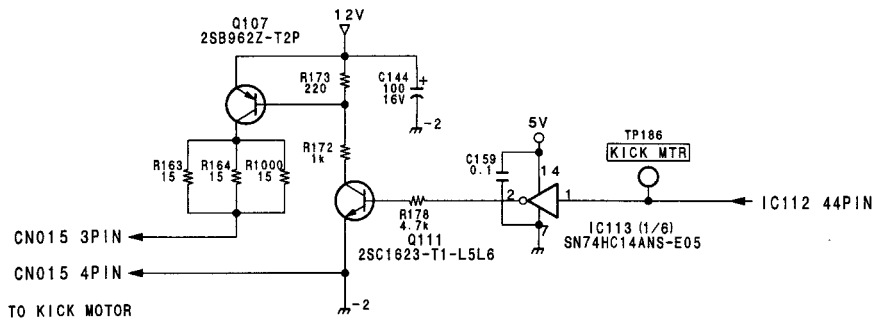
Function : Detection of print paper sending quantity between position paper supply timing sensor and platen chuck and sampling FG of bar code ring.

Level : Rectangle waveform output



4-2-7. Paper ejector motor drive circuit

The motor of paper ejector is driven by control signal from pin 44 of IC112 (CPU).
It is only driven at eject paper time.

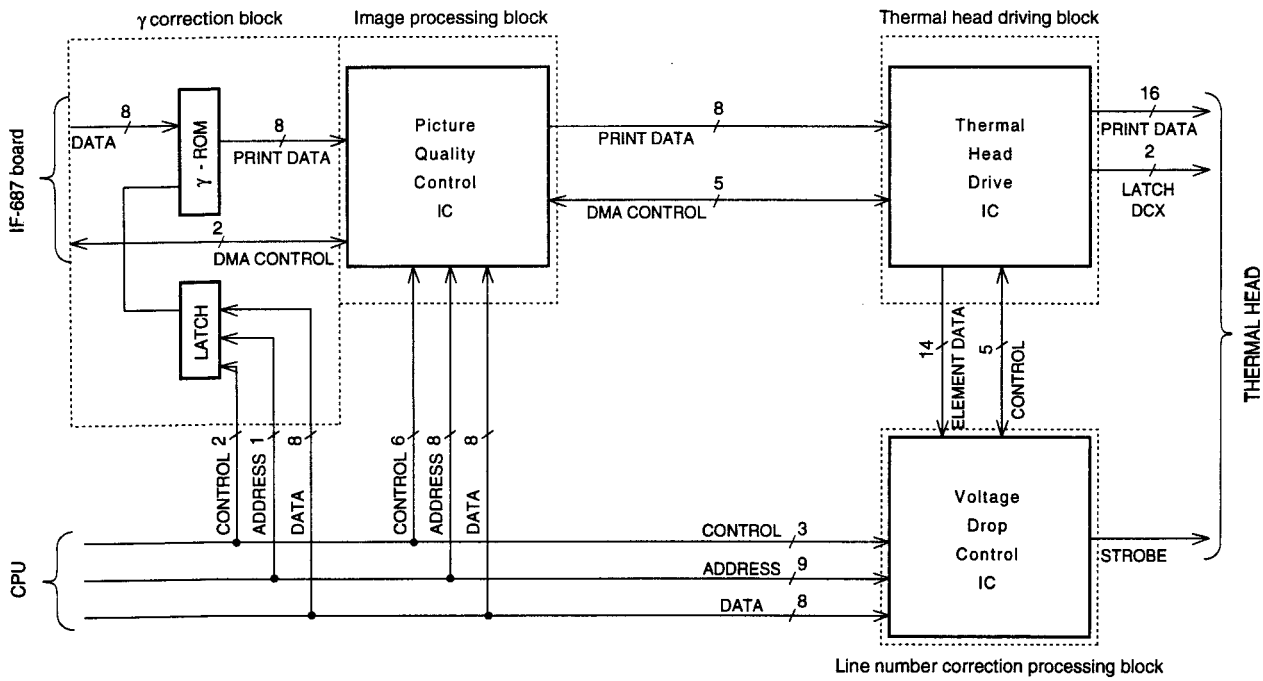


Head control block

The head control block adds the signal process that are various corrections to everyone line parallel print data from IF-687 board and sends it to thermal head to print.
The head control block is composed following five sections.

- γ ROM that corrects γ correction to the parallel print data from IF-687 board.
- Image processing IC(Picture Quality Control IC) that processes pattern recognition interpolation, edge reinforcement, heat accumulation correction.
- Head driving IC that converts parallel data with PWM and sends print data to the thermal head.
- Line number correction IC(Voltage drop control IC) that corrects voltage drop by common resistor of the thermal head.
- The head voltage correction circuit

The print data is received from IF-687 board as parallel data and corrected γ correction. Various signal processing are added by PQC IC. After that, PWM modulation is performed by head driving IC and is sent the print data to the thermal head.



[Each Block]

γ Correction circuit

The print data from IF-687 board is γ corrected by the data conversion table of γ ROM. The address of γ ROM is allotted as follows, YMC each color switching at two bits, temperature compensation of thermal head at four bits, kinds and sending of the ribbon at four bits. γ data is switched according to the switch signal from CPU(IC112).

PQC IC

Edge reinforcement process

To improve definition of the image, edge reinforcement is performed by using digital filter of horizontal and vertical.

Heat accumulation correction processing

Dull of rising and dull cutting from bad head temperature response are corrected by the digital filter.

Head driving IC

PWM modulation processing

Eight bits parallel data is modulated with PWM and is converted serial print data.

Separation print processing

If the print dot area of low density image portion becomes small, clearance between print lines are appeared. As this countermeasure, one step gradation is divided by four and prints.

Line number correction IC

If exothermic resistor element connected the thermal head is increased, composition resistor of element becomes small. Voltage drop by common resistor of harness etc. can not be disregard. The print density becomes low. As this countermeasure, the time turning on electricity to the head element is controlled, print density is corrected.

Head voltage correction

Head voltage can be increased or decreased by changing VCONT signal. Following corrections are performed by using A/D port output of CPU(IC112). V CONT signal is controlled digitally by software.

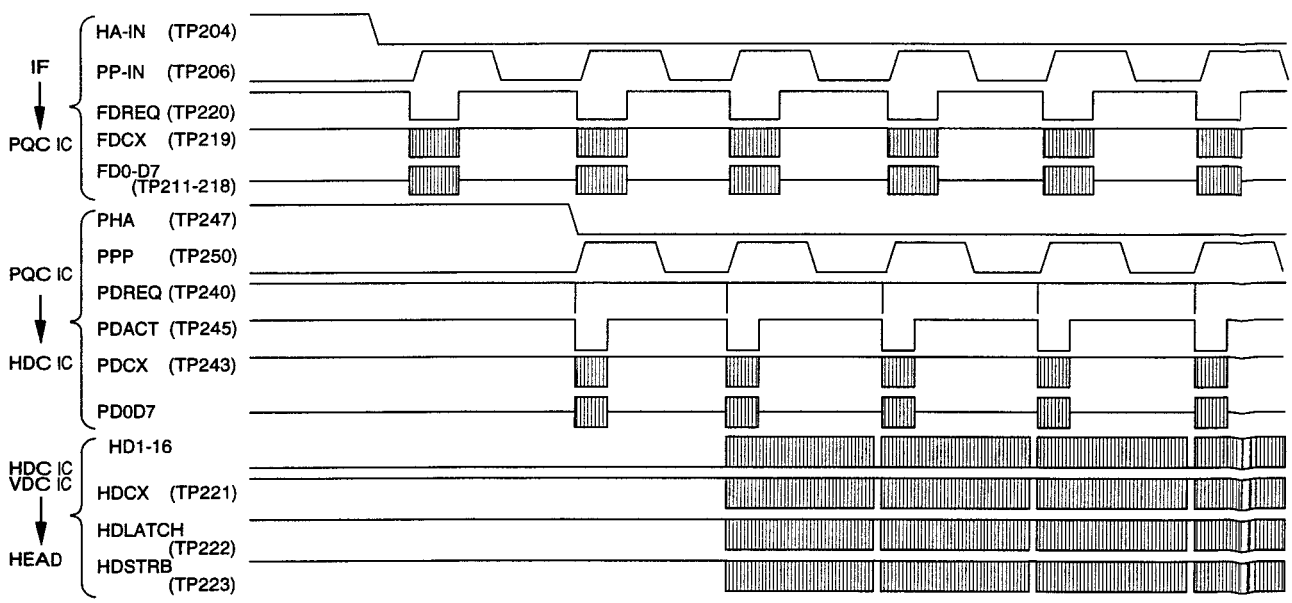
Correction of thermal head temperature.

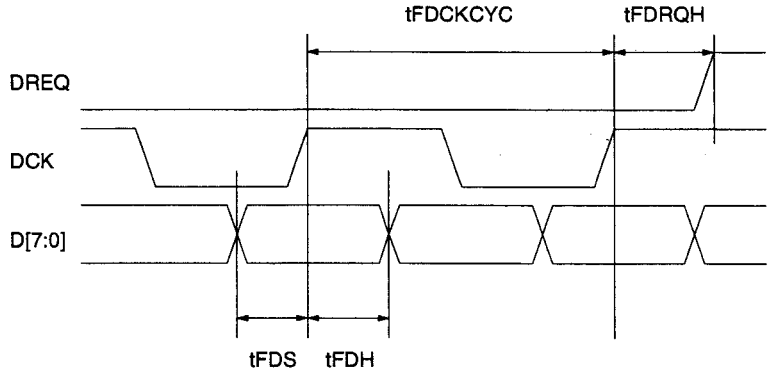
When printing with same head voltage, there is difference between print density by high or low of head temperature. Therefore, the head voltage is increased or decreased by head temperature just before printing.

[Input and output timing]

nPRINTING signal and nHEAD_ACTIVE_IN signal, these are enable signal of thermal head. When both these signals are L, the thermal head becomes print possible mode. NHEAD_ACTIVE_IN(P) signal is in addition to enable signal of IC(IC207,208,210). When this signal is "L", the IC is print possible mode. In this mode, rising edge of PRINT_PULSE_IN signal is inputted to the PQC IC(IC207), nDREQ signal that indicates print data receiving able condition that is outputted to the IF-687 board, DMA transmission of first data is received. If the rising edge of next PRINT_PULSE_IN is inputted to the PQC IC, nHEAD_ACTIVE_P and nPRINT_PULSE_P signal are outputted to the next stage head drive IC(IC208),the first line data is processed the image, nPRINT_DREQ signal from next stage head drive IC is waited for DMA transmission. The head driving IC(IC208) received the PRINT_PULSE_P signal from PQC IC(IC207) and outputted nPRINT_DREQ signal. After that, eight bits print data of one line separation DMA transmission with synchronized PRINT_DCK from PQC IC is received. Next PRINT_PULSE_P signal is inputted, therefore, as serial data of eight port, shift clock (HEAD_CK),data latch output(HEAD_LATCH) and strobe output(HEAD_STRB) are also transmitted to the thermal head. Parallel with DMA transmission of second line data is also received.

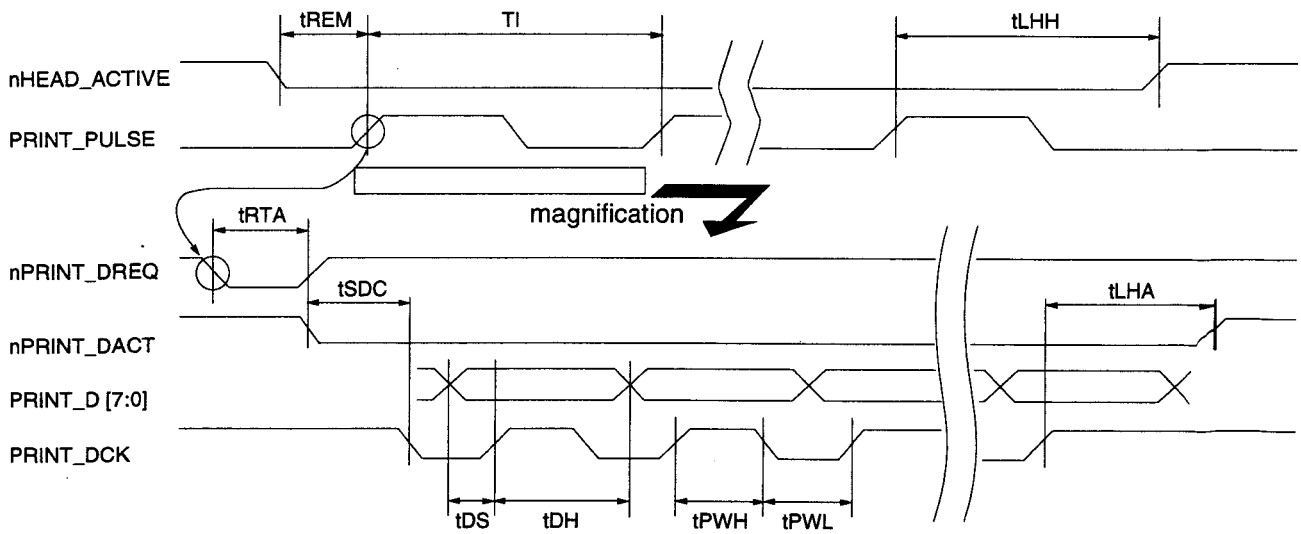
As described above, the first line data is synchronized to second PRINT_PULSE_IN signal and transmitted to head driving IC. It is transmitted to the thermal head with synchronized third PRINT_PULSE_IN signal. The PRINT_PULSE_IN signal is inputted to PQC IC with two more than truly print line number.





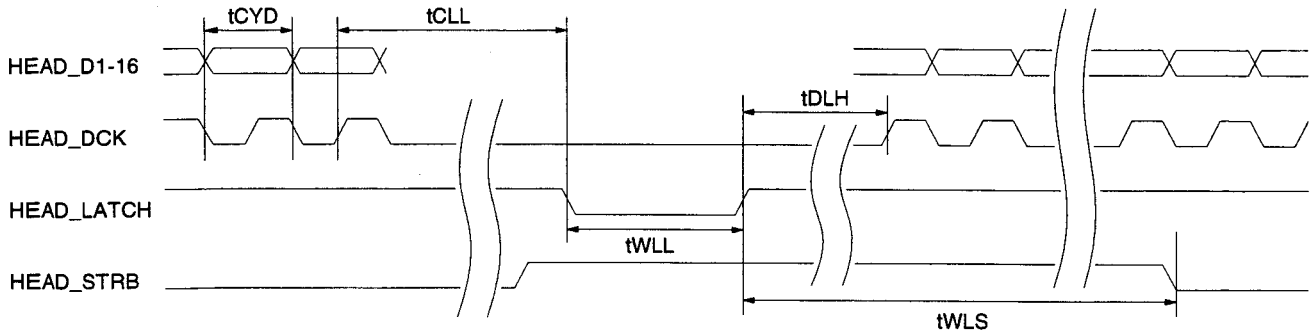
Input and output timing from IF-687 to PQC IC

Item	Code address	MIN	MAX	Unit
DCK cycle time	tFDCKCYC	400	-	ns
Data setup time	tFDS	15	-	ns
Data hold time	tFDH	15	-	ns
DREQ LOW TO HIGH	tFDRQH	20	45	ns



Input and output timing from PQC IC to HDC IC

Item	Code address	MIN	MAX	Unit
nHA ↓ to PP ↑	t REM	10	-	ns
PP ↑ to nHA ↑	t LHH	5.48	-	ns
nDREQ ↓ to nDACK ↓	t RTA	10	-	ns
nDACK ↓ to DCK input	t SDC	0	-	ns
Data setup time	t DS	10	-	ns
Data hold time	t DH	10	-	ns
DCK high level width	t PWH	200	-	ns
DCK low level width	t PWL	200	-	ns
DCK ↑ to nDACK ↑	t LHA	1.8	-	µs



Output timing of thermal head

Item	Code address	MIN	Unit
DATA 1 TO 8 HED_CLK cycle time	t CYD	150.87	ns
nHEDLATCH low level width	t WLL	452.61	ns
nHED LATCH ↑ to HED_CK ↑	t DLH	528.04	ns
HED_CK ↑ to nHED_LATCH ↓	t CLL	678.91	ns
nHED_LATCH ↑ to nHED_STRB ↓	t WLS	2.26	µs

SECTION 5
MECHANICAL DESCRIPTION

5-1. MECHANICAL OPERATION DESCRIPTION

This model is the dye transfer sublimation thermal printer that prints A6 size print paper (width direction). This is platen chuck method.

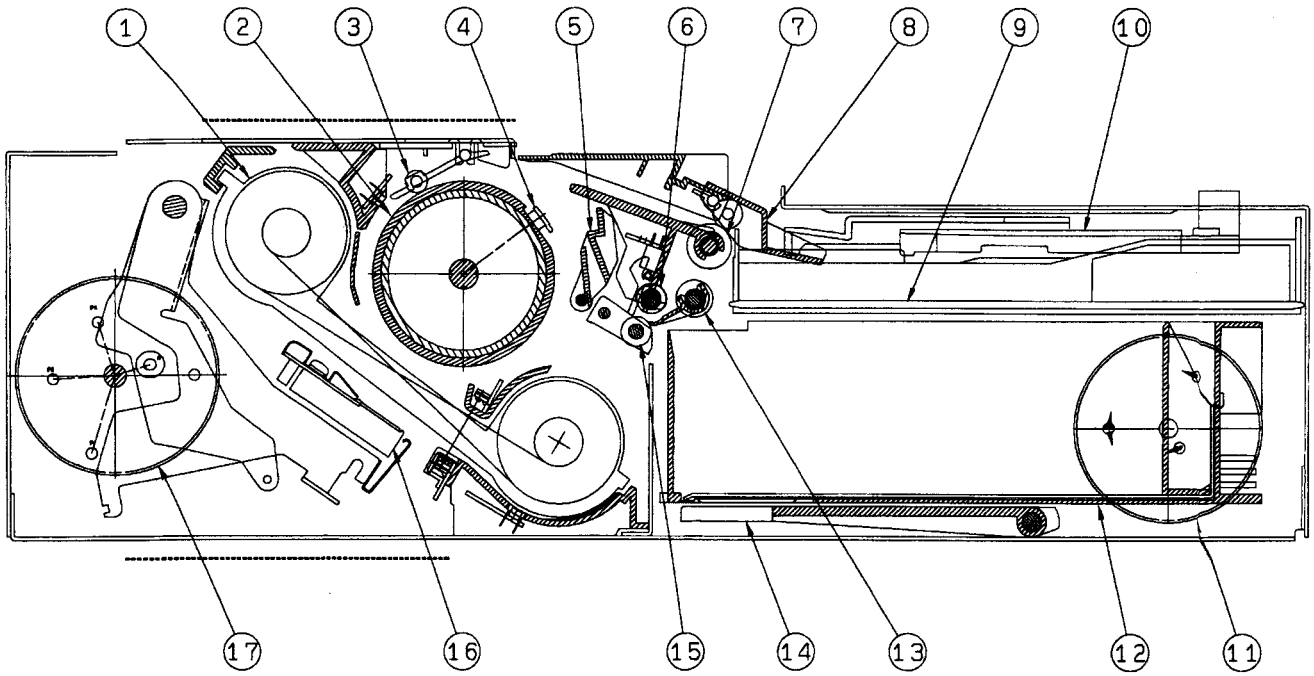


Fig. 5-1.

This model has little big size ribbon cartridge and paper supply tray because this model correspond to 200 images by color standard print paper and ribbon.
The top cover has the lid for a jamming. (The dot line portion of platen upper) Replacement of the thermal head is performed from bottom side of the unit. The bottom side has the lid.(The dot line portion of thermal head lower.)
There are postcard size paper supply tray and paper injector(one piece injection unit) as option.

Major parts layout

① Ribbon cartridge
② Platen
③ Paper hold roller
④ Chuck
⑤ Paper lead flap
⑥ Paper supply roller
⑦ Paper eject roller
⑧ Paper eject flap
⑨ Paper eject tray
⑩ Paper eject arm
⑪ Tray motor cam
⑫ Paper supply tray
⑬ Pick up roller
⑭ Paper supply arm
⑮ Separation roller
⑯ Thermal head
⑰ System cam

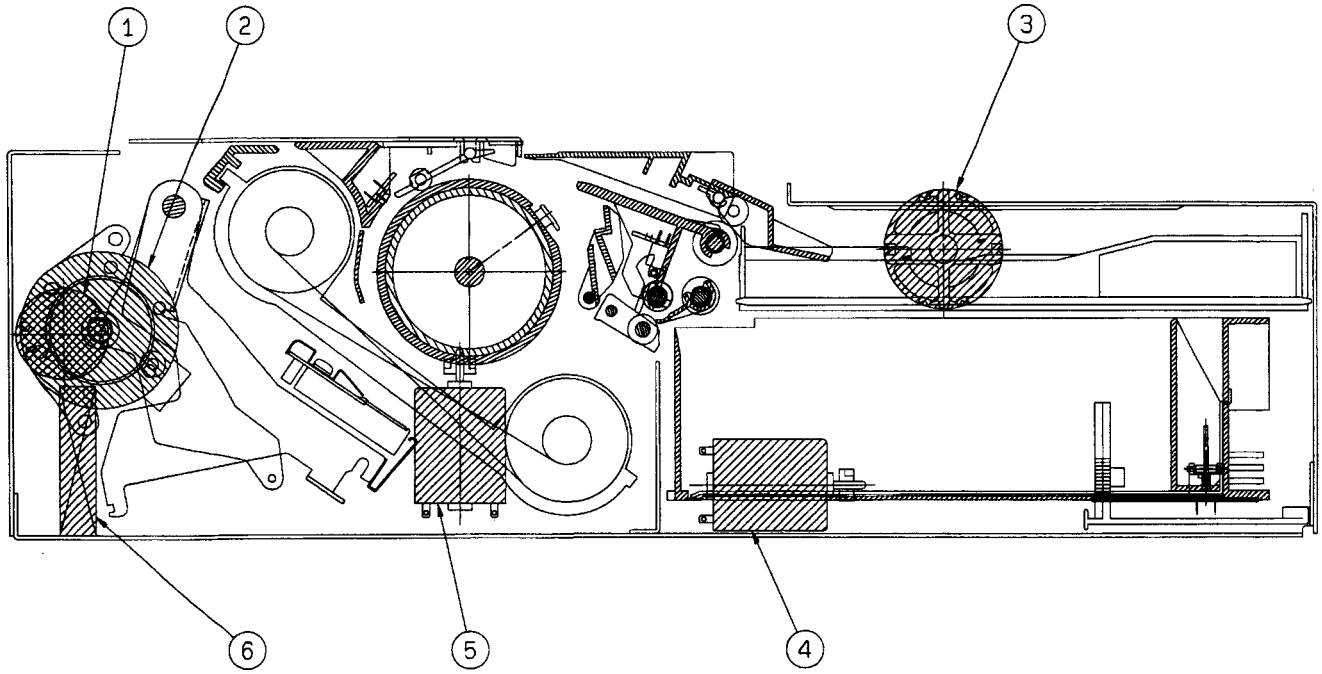


Fig. 5-2.

This unit has five drive motors. There is a fan motor for cooling the thermal head.
There are two fan motor for cooling the switching regulator at the chassis.

① Head motor (DC motor)(correctly rotation /reversely rotation)
- Head up/down drive
- BC link stop
- Platen chuck link drive

② Platen motor (stepping motor) (correctly rotation /reversely rotation)
- Platen drive
- Chuck open and shut (linked with rotation of platen)

③ Paper supply motor (DC motor) (correctly rotation /reversely rotation)
- Pick up roller drive
- Paper supply roller /separation roller drive
- paper eject roller drive
- BC gear drive

④ Tray motor (DC motor) (correctly rotation /reversely rotation)
- Separation roller position move
- Paper lead flap drive
- Paper supply arm drive
- Paper eject arm drive

⑤ Ribbon motor (DC motor) (correctly rotation only)
- Ribbon rewinding

⑥ Fan motor(DC motor) (correctly rotation only, for letting the air)
- Thermal head cooling when printing and over heating.

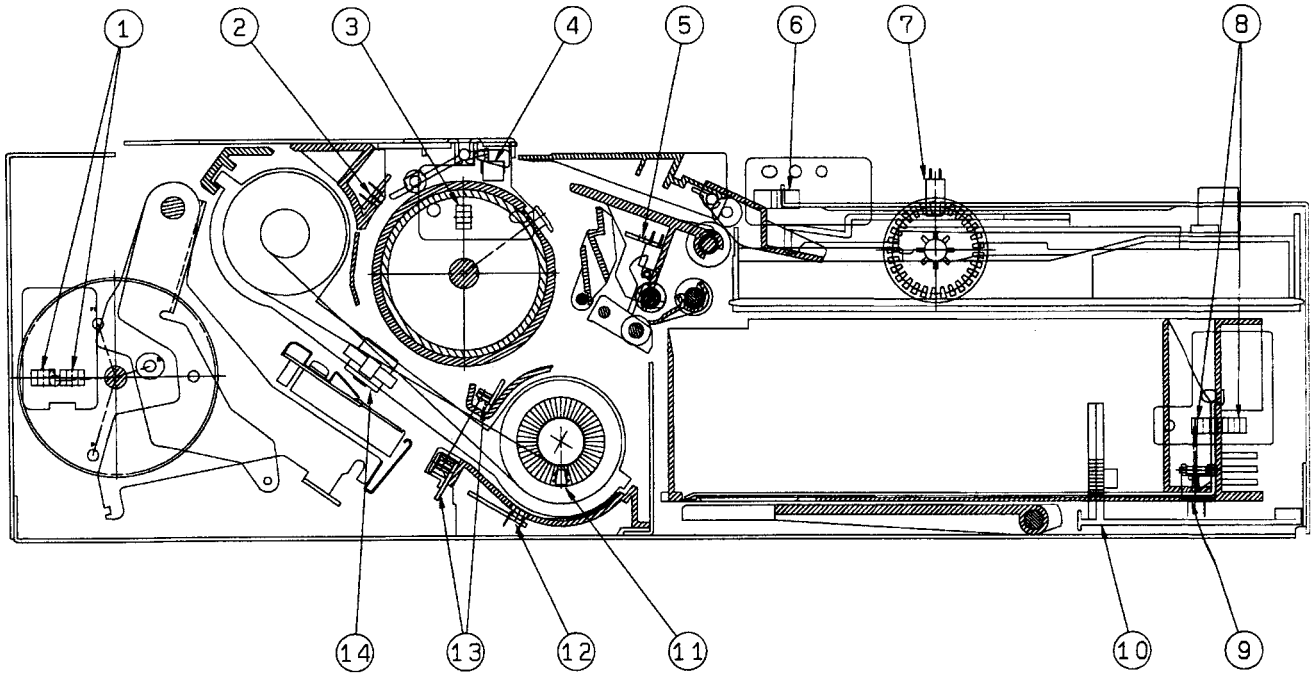


Fig. 5-3.

The sensor names and methods are as follows.

No	Name	type	method
1	Head position sensor	Transparency ×2 Photo interrupter	Detection of head position
2	Paper jamming sensor	Reflection Photo interrupter	Detection of paper jamming
3	Platen position sensor	Transparency Photo interrupter	Detection of platen home position
4	Platen cover sensor	Microswitch	Open and shut judge of cover
5	Paper edge sensor	Transparency Photo interrupter with arm	Detection of paper edge
6	Paper eject timing sensor	Transparency Photo interrupter	Detection of delivery paper miss
7	Paper supply FG sensor	Transparency Photo interrupter	Detection of paper sending quantity
8	Tray position sensor	Transparency ×2 Photo interrupter	Detection of tray motor cam position
9	Tray size sensor	Transparency Photo interrupter with arm	Detection of tray size
10	Paper yes or no sensor	Transparency Arm and photo interrupter	Yes or no judge of paper
11	Ribbon FG sensor	Reflection Photo interrupter	Judge of ribbon rewinding
12	Bar code sensor	Reflection Photo interrupter	Type judge of ribbon cartridge
13	Ribbon code sensor	Transparency ×2 LED and photo transistor	beginning detection of ribbon each color
14	Ribbon cartridge sensor	Microswitch Push catch one type	yes or no judge of ribbon cartridge

Table 5-1.

5-2. PRINTING OPERATION DESCRIPTION

Printing operation is switched at four position by system cam and is performed to assemble three positions by tray motor cam.

5-2-1. Position change during printing operation

Position		Operation content
System cam	Tray motor cam	
Home	Home	① Ribbon cartridge, paper yes or no judge ② Head preheat and fan motor rotation (when there is ribbon or paper) ☆ Print operation start
Paper supply	Home Paper supply Paper supply Paper supply Paper supply Home	① Ribbon type judge, Assembly judge of ribbon and paper ② Beginning detection of ribbon (yellow) ③ Paper supply ④ Paper chucks the platen. ⑤ Jamming judge ⑥ Positioning of paper print start
Print	Home	Yellow print
Fast forward	Home	Beginning detection of ribbon (magenta) Positioning of paper print
Print	Home	Magenta print
Fast forward	Home	Beginning detection of ribbon (cyan) Positioning of paper print
Print	Home	Cyan print
Fast forward	Home	To platen eject paper start position (correctly rotation)
Home	Home Home Home Paper eject Home	① Platen is rotated reversely. Paper eject start ② Platen Chuck is released. ③ Paper is ejected on the paper eject base. ④ Paper is fallen on the paper eject tray. ☆ Print operation is finished.

Table 5-2.

5-2-2. Home position

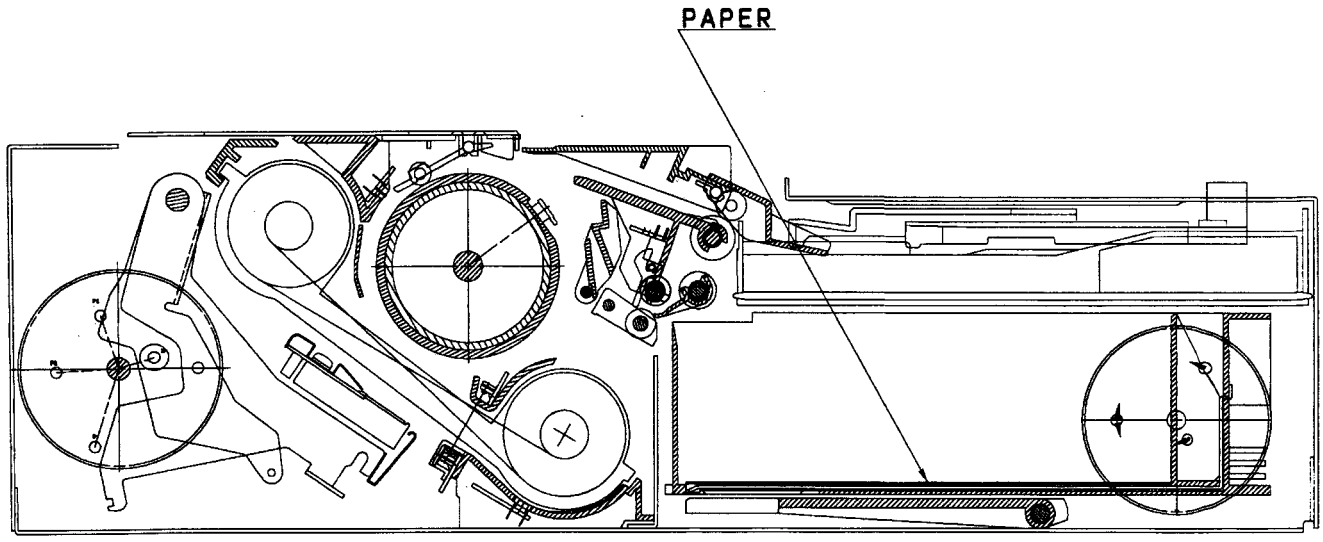


Fig. 5-4.

After power switch is turned ON,

- When power switch is turned ON, if the system cam or the tray motor cam is not stayed at the home position, each cam will be returned to the home position.
- When power switch is turned ON, if the platen is not the home position, the platen will be returned to the home position with only inserted the paper and ribbon.

The system cam, the tray cam and the platen are at the home position, mechanism is not operated.

Yes or no judge of the ribbon cartridge and the print paper is performed, if there is each of them, head preheating and fan motor rotation are performed.

5-2-3. Delivery paper position

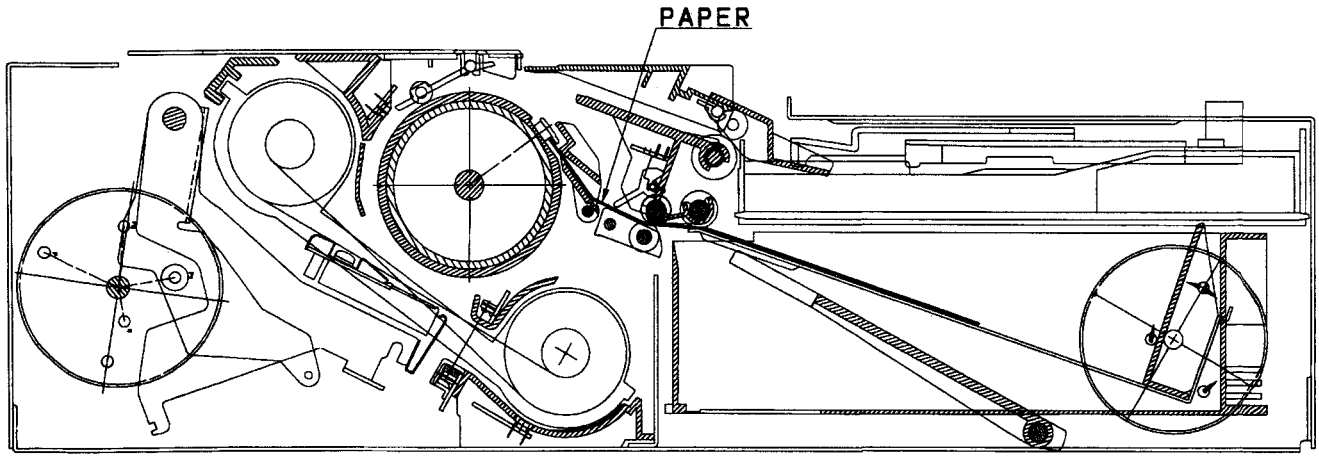


Fig. 5-5.

When the print button is pressed, the unit becomes this position. Ribbon bar code ring is red, the type of ribbon is judged. At the same time, judge of paper supply tray size is performed, combination of ribbon and paper is judged.
Reading of bar code ring is performed only when the system cam is stayed at paper supply position. The paper supply motor is rotated and rotated bar code ring via paper supply block and BC arm. The bar code is read by bar code sensor. If the platen is not the home position, return operation to the home position of the platen is performed.

Next, beginning detection of yellow ribbon is performed. The supply paper motor is rotated and the paper is conveyed to the chuck position. After that, while rotating the platen, paper is chucked. At this time, tray motor cam is set to paper supply position, paper supply arm is lifted, the paper is pressed to the pick up roller. At the same time, separation roller is pressed to the paper supply roller via TM link and supplied to the paper. This separation method is used.
The paper supply FG sensor is counted from when the paper passes through the paper edge sensor, timing of platen rotation start is measured.

When the platen is rotated about 55°, the paper is chucked perfectly.(Actually, the chuck is closed gradually.) At this time, paper conveyance quantity by paper supply roller is little much than paper conveyance quantity by platen.
Next, when the platen is rotated about 120°, the paper jamming sensor condition is surveyed, if the paper is not reached, it is judged chuck miss, printing operation is stopped. In this case, open the lid for a jamming and take from the paper.
If the chuck is correctly performed, print start position of paper is detected.

Note:

- The paper supply tray becomes depth because this model corresponds to 200 images. Therefore paper setting is little difficulty. Specially, if the paper is set with it's folded, paper is not supplied. The symptom of this condition, confirm the paper condition in the paper supply tray.
- When paper supply miss is occurred, paper supply arm is down once and paper supply operation is performed again.(until two times) This is not trouble.
- After paper is supplied, paper supply motor is reversely rotated a little in order to return the paper in the paper supply tray. This is not trouble.

5-2-4. Printing position

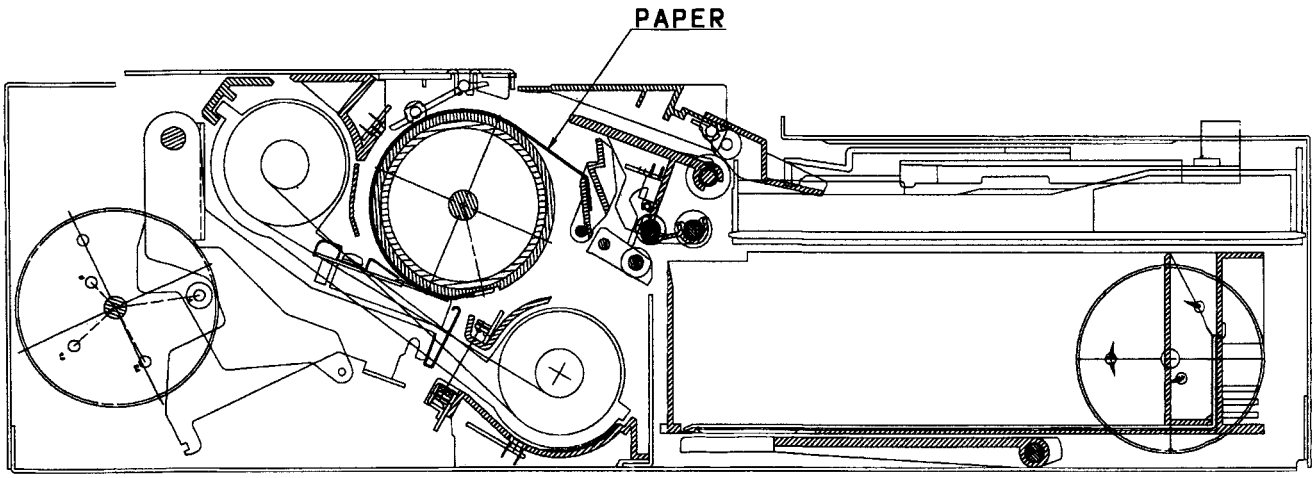


Fig. 5-6.

Print is started from when the platen is rotated about 250°. The system cam is rotated, the thermal head is pressed to the platen and the ribbon motor and platen are rotated. The figure is indicated the print start condition of yellow. The rear edge of paper is reminded at paper lead flap.

5-2-5. Fast forward position

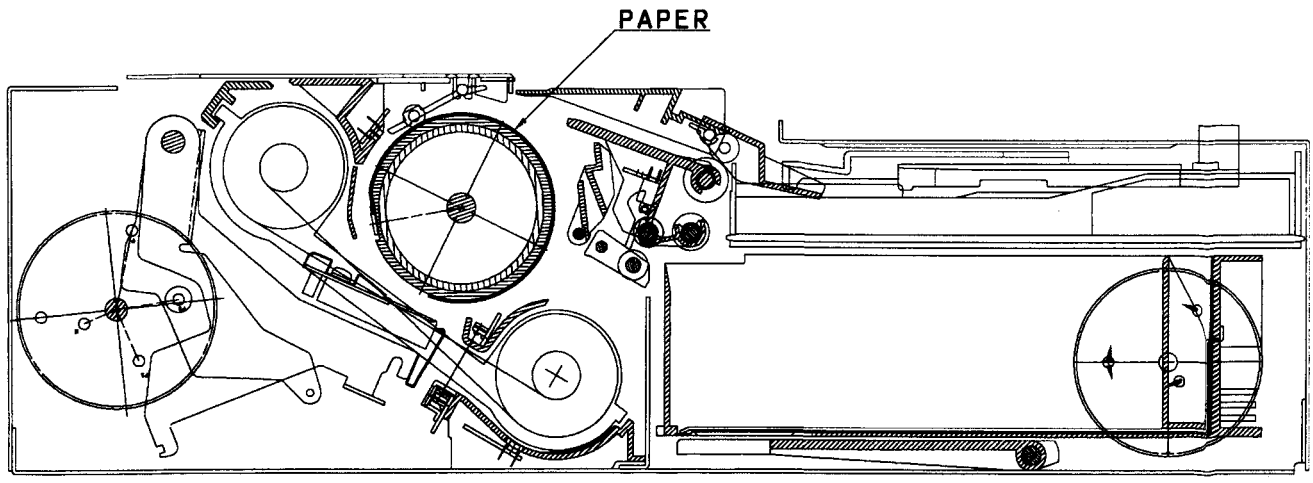


Fig. 5-7.

Each color printing is ended, the thermal head is separated and fast forward is performed.
Platen ..... positioning of paper, positioning of delivery paper start
Ribbon ..... beginning detection of magenta and cyan

5-2-6. Delivery paper position (Almost same as home position)

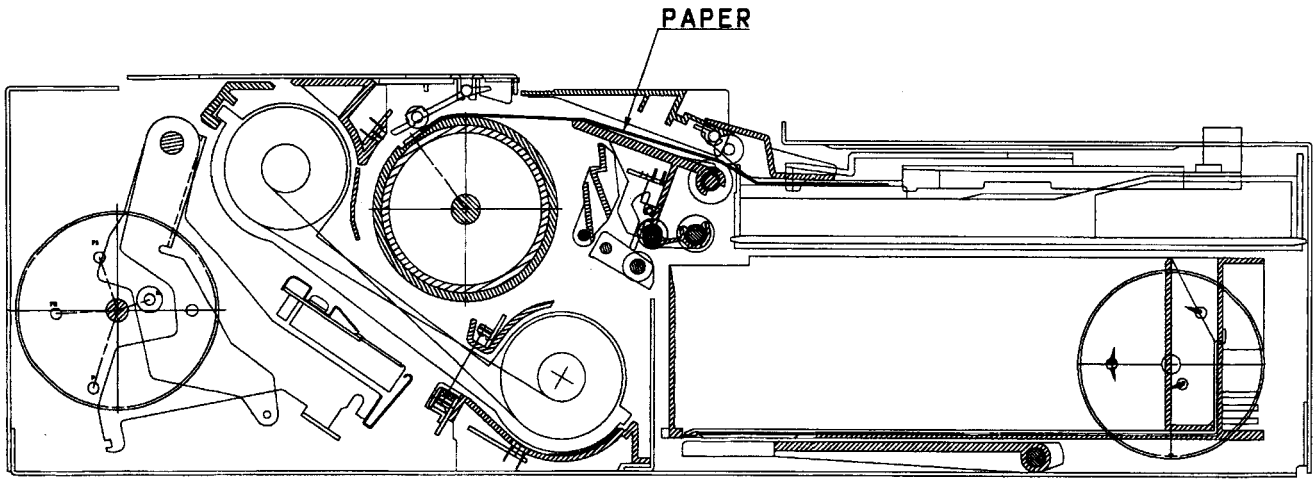


Fig. 5-8.

When the paper is reached at eject start position, the system cam is returned to the home position, the platen is rotated reversely and is ejected the paper. At the same time, eject paper roller is rotated by rotating the paper supply motor. The chuck is opened gradually according to the rotation of the platen, the paper is conveyed to the eject paper base. Lastly, tray motor cam is positioned at eject paper position, eject paper arm is moved and the paper is fallen on the eject paper tray.

5-3. PLATEN DRIVE SECTION

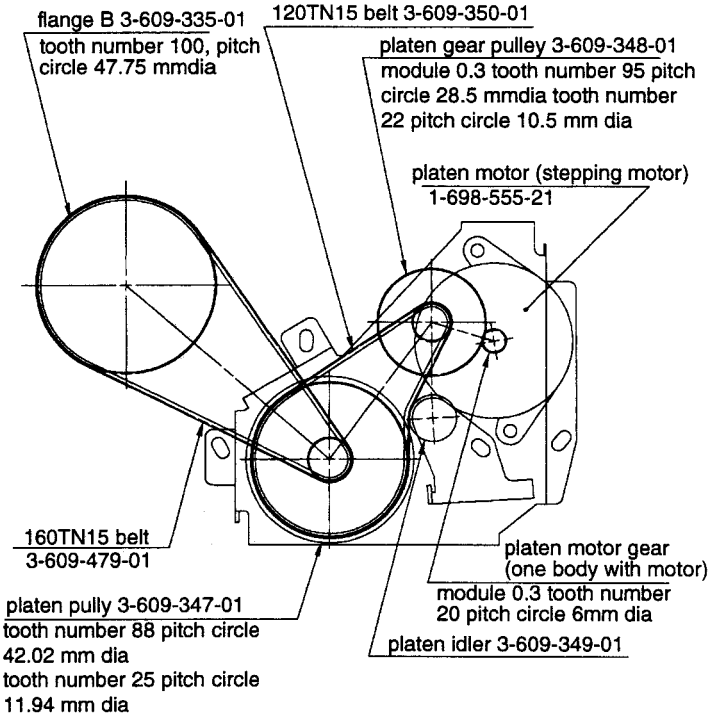
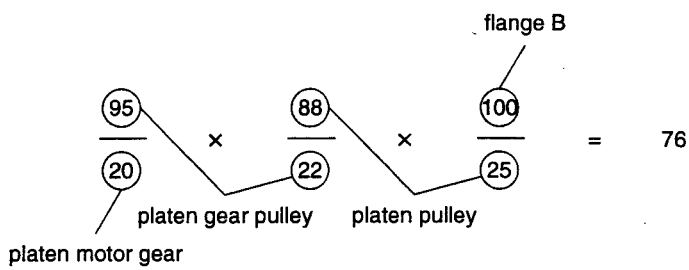


Fig. 5-9.

The platen motor performs platen drive and open and shut of chuck.
In platen drive, module of the gear is used 0.3 mm and the belt is used TN15 type (belt pitch : 1.5 mm) to prevent the unevenness print. Specially, two belts are used, therefore unevenness print will not be disappeared. If the tooth of belt is jumped, the belt may be damaged, therefore replace the belt new one.

5-3-1. Platen drive section gear ratio

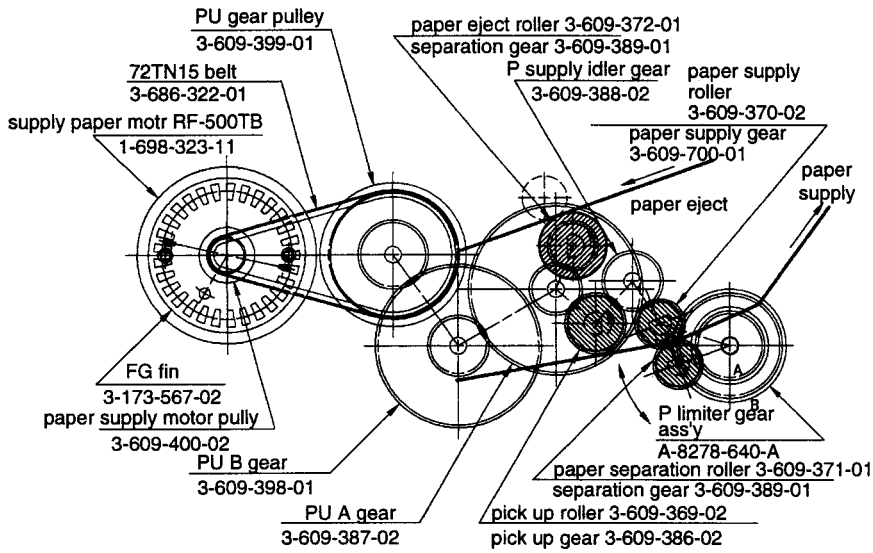


5-3-2. Unevenness print

If the gear or pulley is damaged, a vertical line is periodically appeared on the print. In this case, replace it to applicable pulley or gear as follows.

- Platen motor gear ..... pitch 2.1 mm
- Platen gear pulley ..... pitch 9.8 mm
- Platen pulley ..... pitch 39.3 mm
- Flange B ..... every time same place

5-4. PAPER SUPPLY AND EJECT DRIVE SECTION



Paper supply and eject drive section is composed by paper supply motor block ass'y and paper supply block ass'y.

The pick up roller sends the paper in the paper supply tray. In this stage, some papers are conveyed. Next, when the papers are sent to between paper supply roller and separation roller, the most upper paper is only conveyed to the platen block by paper supply roller. The papers later than second paper are not advanced in this position. This is cause that the rotation of paper supply motor is directly transmitted until paper supply motor but, it is transmitted to the separation roller via P limiter gear ass'y.
When only the paper is supplied, the separation roller is pressed to the paper supply roller. When there is one paper or nothing, gear B and A is slipped and separation roller is rotated correctly since transmission drive power from paper supply roller to separation roller is stronger than drive power from P limiter gear(torque limiter). But when more than two papers are put between paper supply roller and separation roller, gears A and B of P limiter gear ass'y are rotated same direction and the separation roller is rotated reversely since direct transmission drive power from paper supply roller to separation roller becomes weak because the paper is slipped, the drive power from P limiter gear becomes bigger. Such as this, when one piece, the paper is conveyed since the separation roller is rotated correctly. When more than two pieces, most upper paper is conveyed only and later two pieces are returned since the separation roller is rotated reversely.
Lastly, the printed paper is conveyed to the paper eject section by the paper eject roller.

SECTION 6
TROUBLESHOOTING

6-1. ELECTRICAL SYSTEM PROBLEMS

1) The system does not start

<Cause> Incomplete IC204 soldering, EPROM disconnection or defect can be suspected.

2) When the whole alarm LED lights up and stops when the power is turned ON

<Cause> IC240 of the system controller is not initialized normally.

<Countermeasure> Communication with the mechanical controller may have failed. Check the harness connecting CN204 of the IF-687 board and CN006 of the PRT-11 board. Or communication with the EEPROM (IC201 of IF-687) may have failed. In this case, check the periphery of IC201.

3) Data from the personal computer is not accepted (not operating with the driver software)

4) The alarm lamp lights up other than paper jamming

<Cause> There may be problems in the periphery of IC209 of the interface controller.

<Countermeasure> Press S207 of the IF-687 board to perform the test printing.
If printing is not performed, defect of the periphery of IC204 of the system controller can be suspected.
If printed normally, check IC209, IC102, and IC205 through IC207.

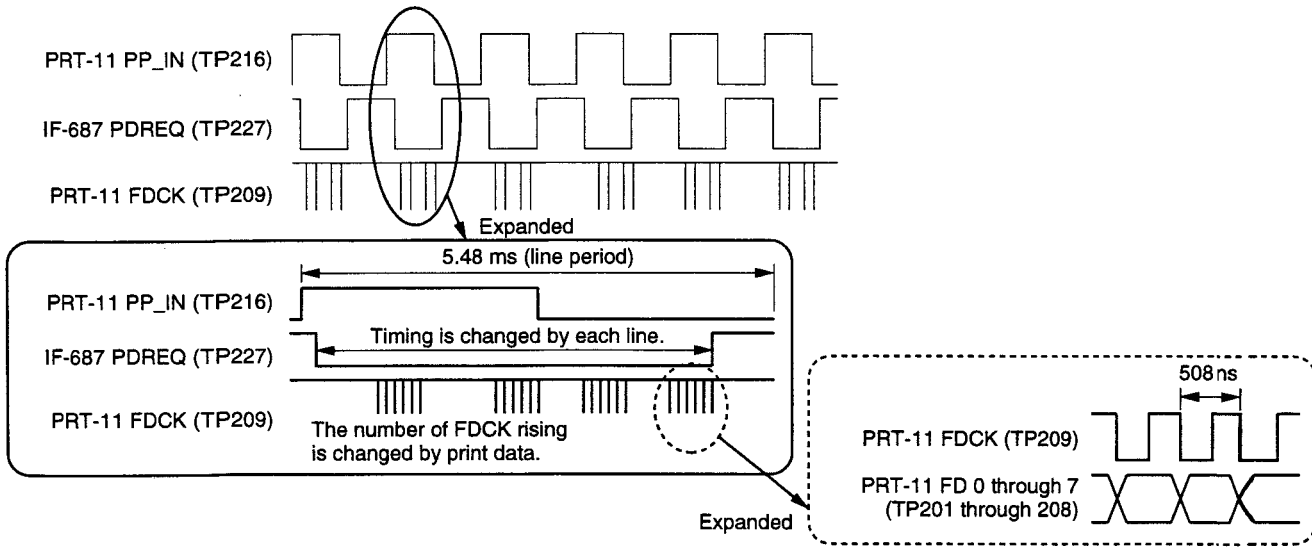
5) Printing result is NG

<Countermeasure> First print the built-in stair-step pattern. The ramp pattern can be used if error images are caused by the gradation.
If OK : Defect of the interface can be suspected.
Check IC209 and its periphery.
If NG : As the problem most probably lies in IF-687 or PRT-11, check the service command DRAM.
If OK, the problem may lie in PRT-11 after IF-687, IC105, and IC106 (or harness)
If NG, the data bus system centering around IC107 and IC108 of IF-687 is faulty.

Output system(print) relation point

PP IN signal on the PRT-11 board is the signal that is risen by every print 1 line outputted from CPU on the PRT-11 board. The print data demand signal PDREQ to IF-687 board is outputted every 1 line (rising down), when receiving the necessary data, the PDREQ signal is risen.

The print data from IF-687 board is synchronized the FDCK signal and outputted.



6-2. MECHANISM TROUBLESHOOTING

The three main troubles of the printer mechanism deck are as follows.
1. Paper feed troubles such as miss-feeding, double-feeding, etc.
2. Paper ejection troubles such as jamming which occur after printing
3. Printing troubles from printing results

The following describes how to first locate the area with the troubles and how to solve the troubles smoothly.

1. Paper feed troubles

Location : Paper supply block assembly

Chuck trouble occurs because the paper has not reached the platen. The possible causes are the paper can not be fed properly due to the wear of the paper feed rubber or the platen could not chuck the paper due to damage of parts.
If paper is double-fed, check the torque limiter and separating roller.
If the top part of the paper is badly scratched (scratches caused by the mechanism are allowed to a certain extent), check the roller as the paper feed load may have become lighter.

Location : Paper supply tray assembly

The paper cannot be fed even though the paper feed block assembly and paper supply lever are working normally.
This is because the paper is not being fed from the paper supply tray.
The possible causes are the deformation of the claw of the paper supply tray or the paper is bent when the paper is set to the tray.

2. Paper ejection trouble

Location : Platen cover assembly

After completing printing, paper ejection is carried out, but the paper is not ejected. Paper is jammed at the top of the platen.
This paper ejection trouble is caused by the damage of paper holding parts of the platen cover (upper cover which can be opened and closed for reparing paper jamming).

Location : Paper supply block assembly

Paper jams near the paper ejection exit and not on top of the platen.
This may occur when the paper ejection flap attached to the paper feed block assembly drops or when the support portion is damaged.

3. Printing trouble

Location : Platen motor assembly

Printing blurring (vertical lines).

This may be caused by the scratches and damage of the gears of the platen motor.

Details of locating the damaged gear are described in the operation manual.

Location : Thermal head

Horizontal lines on the printed side of the paper.

This may be caused by tone unevenness of the head and wear of the head.

Location : Paper supply tray assembly, head link section

The print is badly out of position.

To locate the trouble area, print using the following method. First, print using a standard size paper. The just before printing is completed, open the print cover.

The platen stops. Check the gap width between the black rubber of the platen and paper. If the gap is consistent throughout from top and bottom, it means that the print is out of position because the head is not attached at the proper position. Check the head link section around the head attached.

If the gap is not consistent, check the paper supply tray.